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Monthly Message

This is a translation of an early Hindu medical oath of unknown origin:

YOU MUST BE CHASTE AND ABSTEMIOUS . SPEAK THE TRUTH . NOT EAT MEAT .. CARE FOR THE GOOD OF ALL LIVING BEINGS . DEVOTE YOURSELF TO THE HEALING OF THE SICK EVEN IF YOUR LIFE BE LOST BY YOUR WORK . DO THE SICK NO HARM . NOT . EVEN IN THOUGHT . SEEK ANOTHER'S WIFE OR GOODS . BE SIMPLY CLOTHED AND DRINK NO INTOXICANT . SPEAK CLEARLY . GENTLY . TRULY . PROPERLY . CONSIDER TIME AND PLACE . ALWAYS SEEK TO GROW IN KNOWLEDGE .. DO NOT TREAT WOMEN EXCEPT THEIR MEN BE PRESENT . NEVER TAKE A PRESENT FROM A WOMAN WITHOUT HER HUSBAND'S CONSENT . . WHEN THE PHYSICIAN ENTERS A HOUSE ACCOMPANIED BY A MAN SUITABLE TO INTRODUCE HIM THERE . HE MUST PAY ATTENTION TO ALL THE RULES OF BEHAVIOR IN DRESS . DEPORTMENT . AND ATTITUDE .. ONCE WITH HIS PATIENT . HE MUST IN WORD AND THOUGHT ATTEND TO NOTHING BUT HIS PATIENTS CASE AND WHAT CONCERNS IT .. WHAT HAPPENS IN THE HOUSE MUST NOT BE MENTIONED OUTSIDE . NOR MUST HE SPEAK OF POSSIBLE DEATH TO HIS PATIENT . IF SUCH SPEECH IS LIABLE TO INJURE HIM OR ANYONE ELSE ... IN FACE OF GODS AND MAN . YOU CAN TAKE UPON YOURSELF THESE VOWS . MAY ALL THE GODS AID YOU IF YOU ABIDE THEREBY . OTHERWISE MAY ALL THE GODS AND THE SACRA . BEFORE WHICH WE STAND . BE AGAINST YOU . AND THE PUPIL SHALL CONSENT TO THIS . SAYING . SO BE IT

Frank B. Berry

FRANK B. BERRY, M. D.
Assistant Secretary of Defense
(Health and Medical)

Quoted from *The Peaks of Medical History*, by Charles L. Dana, Paul B. Hoeber, Inc., New York.

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Foreword

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal.*

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UNITED STATES ARMED FORCES MEDICAL JOURNAL

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ACUTE RESPIRATORY ILLNESS CAUSED BY ADENOVIRUSES

A Military Problem

MAURICE R. HILLEMAN, *Ph. D.*

THE ACUTE respiratory illnesses of man present a major medical problem to the armed services in time of peace and more prominently in time of war. The magnitude of the problem in the U. S. Army during the last World War is illustrated in the example cited by Duff:

> During the period of World War II, 1942-1945, from a mean strength of 6,076,135 there were 4,086,562 admissions for common respiratory disease recorded by the United States Army. The average time lost from duty by a person admitted for treatment of common respiratory disease during this period was 6.5 days . . . . The 4,086,562 cases admitted during the war period thus resulted in approximately 26.5 million man-days lost from duty, or approximately 18,000 each day of the war. An Army division is composed of 15,000 personnel. Thus, more than equivalent strength of one Army division were absent from duty every day of the war because of the common respiratory diseases.[1]

During World War II, the members of the Commission on Acute Respiratory Diseases conducted extensive investigations of the respiratory illnesses of soldiers in an effort to delineate the clinical syndromes and to elucidate the causes wherever possible.

Certain portions of this paper were presented before the Military Preventive Medicine Section at the 105th Annual Meeting of the American Medical Association, Chicago, Ill., on 14 June 1956.

From Walter Reed Army Institute of Research, Washington, D. C.

These workers[2-4] observed that, aside from respiratory illnesses caused by bacteria or known viruses or from the common cold, there remained a large bulk of acute respiratory illnesses of unknown causation. These belonged in the general category of "febrile catarrhs" differentiated from influenza by Stuart-Harris, Andrewes, and Smith[5] in 1938. The members of the Commission recognized at least three distinct clinical entities among the cases of "febrile catarrh" which they referred to as undifferentiated acute respiratory disease (ARD), nonstreptococcal exudative pharyngitis, and primary atypical pneumonia (PAP). They demonstrated the separate causes of ARD, PAP (associated with the development of cold agglutinins), and the common cold based on the results of transmission experiments[6,7] in human volunteers by employing filtered throat washings from patients. In further epidemiological studies, it was shown[1,3,4,8] that epidemics of ARD occurred in recruits but not in "seasoned" men and that immunity seemed to follow this infection.

CAUSES

During and following World War II, numerous attempts were made to recover the virus of ARD in experimental laboratory hosts but none was successful. During 1953, human cell tissue culture was first applied to the problem, and this resulted in the independent discovery by Rowe and associates[9] and by Hilleman and Werner[10] of a new family of viruses which inhabit the respiratory tract of man. The viruses (adenoid degenerative or AD) of Rowe and co-workers[9] were recovered as "masked" agents from surgically removed human adenoidal tissue being cultivated in tissue culture. The respiratory infection agents (RI) discovered by Hilleman and associates,[10,11] which included types now designated 3, 4, and 7, were recovered from throat washings of military patients with ARD or PAP in an epidemic. The prototype strain RI-67, as well as other viruses recovered in the epidemic, were shown by serologic methods to be related causatively to the disease in the recruits. Following this, Dingle and associates[12,13] showed by retrospective serodiagnosis that the RI-67 virus was related to cases of ARD which occurred among soldiers during World War II.

The new family of respiratory viruses has been designated by several names in the past. Huebner and associates[14] and Rowe and co-workers[15] have used the name adenoidal-pharyngeal-conjunctival (APC) viruses. Hilleman and associates[10,11,16] referred to these agents as the RI family of viruses and Ginsberg and co-workers[13,17] designated certain of the agents as ARD viruses. More recently a new name, Adenovirus,[18] was adopted by the principals working in this field, and it was agreed that the previous designations of RI, APC, and ARD be no longer used.

Huebner and associates[14] and others[11,15,19-21] have shown that there are at least 14 distinct serotypes among the agents of the Adenovirus family. These serotypes are readily distinguished by the serum neutralization technic employing monotypic rabbit antisera. On the other hand, all the types of virus elaborate a common group-specific "soluble" complement-fixing antigen[10,14,15,22,23] which can be separated readily from the virus by filtration or centrifugation procedures. Morphologically, the type 4 RI-67 and type 2 AD-6 strains have been shown to resemble influenza virus and to consist of spherical elementary bodies around 100 mμ in diameter.[23] The CF antigen is of smaller size.

CLINICAL FINDINGS

The clinical findings in patients with acute respiratory illness caused by the Adenoviruses indicate that all segments of the respiratory tract may be affected, the symptoms and signs in any particular patient depending upon the degree of damage and the location of the areas involved. In a recent study by Dascomb and Hilleman[16] of 45 proved cases of acute respiratory illness caused by the Adenoviruses (predominantly or entirely type 7 virus) in newly recruited soldiers, it was observed that the most prominent clinical features were fever, pharyngitis, and severe cough. These were accompanied by constitutional symptoms such as headache, malaise, chills, myalgia, and dizziness which were usually mild. About half the patients developed discrete or confluent patches of nonbacterial white exudate on the hyperplastic lymphatic tissue in their throats, and the majority exhibited a coryzal feature. Laryngitis with hoarseness was a common complaint. Bilateral conjunctivitis and lymphadenopathy of the head and neck region were commonly observed among the patients studied. Lower respiratory tract involvement consisting of tracheobronchitis and bronchiolitis was a frequent finding, and about 16 per cent presented roentgenographic evidence of pneumonitis. The mean maximum temperature in the patients was about 103°F, and the fever lasted approximately 6 days on the average. The average hospital stay was around 10 days.

These disease conditions are commonly referred to as grippe, catarrhal fever, virus pneumonia, acute pharyngitis, or severe colds. More specifically, they belong in four respiratory disease entities established by the Commission on Acute Respiratory Diseases[2-4] during World War II [*viz.*, undifferentiated acute respiratory disease (ARD), nonstreptococcal exudative pharyngitis, bronchitis resembling atypical pneumonia (Br-AP), and primary atypical pneumonia (PAP) (unassociated with the development of cold agglutinins)] and the syndrome of pharyngoconjunctival fever described more recently by Parrott and co-workers[24] and by Bell and others.[25] Collectively, these entities belong in the syndrome of febrile catarrh established in 1938 by Stuart-Harris, Andrewes,

and Smith to distinguish an illness having catarrhal aspects but otherwise resembling influenza. Kjellen[26] in Sweden has shown that viruses of the Adenovirus family may be involved also in certain cases of mesenteric lymphadenitis, and Jawetz and associates[20] have presented evidence implicating the Adenoviruses in patients with keratoconjunctivitis. The Adenoviruses do not appear to be associated with the ordinary common cold in which there is a watery discharge with little or no fever,[10,13,16,17] with primary atypical pneumonia in which the test for cold or Streptococcus MG agglutinin becomes positive,[10,13,16,17,22,27] with psittacosis or ornithosis, with Q fever, or with influenza A, B, and C.

There is no specific therapeutic treatment for Adenovirus infections.[16] The therapy of the disease is symptomatic and may include steam inhalation, codeine, aspirin, bed rest, and adequate fluid intake.

LABORATORY DIAGNOSIS

Reliable laboratory test procedures have been developed for diagnosis of infection with the Adenoviruses.[10,15,28] These involve either (a) the demonstration of a significant increase in amount of complement-fixing (CF) or neutralizing antibody against the virus in the patient's serum during the progress of the disease or (b) the recovery and identification of the causative agent. Antigen employed for performance of the CF test is prepared from tissue cultures infected with an Adenovirus, usually RI-67.[10,28] The "soluble" antigen active in such material is sufficiently group-specific so that antigen prepared from a single type will suffice to detect infection with any of the known types.[11,15,28] The demonstration of a fourfold or greater increase in CF antibody in the patient's serum during convalescence (two weeks after onset) as compared with the acute phase specimen is considered to be of diagnostic significance. For serodiagnosis by the neutralization procedure, the titer of viral "inactivating" antibody in the acute and convalescent (three weeks after onset) serum samples is determined in tissue cultures. As in the CF test, a fourfold or greater increase in antibody level is diagnostic, but a "battery" of different serotypes must be employed because the serologic response in most patients usually is markedly type-specific against the homologous infecting strain.

At the present time, types 3, 4, and 7 virus appear to suffice for diagnosis of the military cases.[11,21] The majority of the cases reported in civilian groups are type 3.[17,24,25] For virus recovery attempts, the patient's throat washings are inoculated into appropriate human cell tissue cultures and the recovered agents are identified in neutralization or CF tests with known positive anti-

sera. Virus usually can be isolated from 25 to 50 per cent of all patients who have Adenovirus illness proved by serologic procedures. The virus recovery and serum neutralization tests, which must be carried out in tissue culture, are necessarily laborious and expensive and are therefore limited to research laboratories. The relatively simple in vitro CF test, on the other hand, is best suited for routine diagnosis where the identification of the particular infecting type is unnecessary.

EPIDEMIOLOGY

Respiratory illness caused by the Adenoviruses is widespread in military populations, primarily among newly inducted soldiers.[10,11,13,17,21,22,27,28] The illness is far less common among "seasoned" troops than in recruits.[27,29] The disease occurs in epidemic form throughout the year but is most prevalent during the winter months, when it may account for as many as 9 of every 10 hospitalizations for respiratory illness in recruit training camps.[22,27,29] This occurrence in all seasons is in striking contrast to that of influenza, which is epidemic only during the winter and is seldom encountered during other times of the year. The year-round prevalence of Adenovirus infections indicates that the virus resides continuously in the human population and that at least one means for perpetuating the disease is by contact with patients. The epidemic pattern[29] of outbreaks of Adenovirus respiratory disease in individual companies of soldiers during a period of high prevalence in the camp is, like that of influenza, explosive in nature, having reached the peak by the third week after the men were inducted into the Army. The over-all occurrence of the disease on the post, however, appears as a continuous curve which is a summation of the series of outbreaks in the individual training companies.

The importance of respiratory illness caused by the Adenoviruses to the armed services is reflected in the high proportion of soldiers who develop the clinical disease during their basic training period. The findings of a recent study[29] of the incidence of Adenovirus infections among recruits made at Fort Dix, N. J., indicate that approximately 80 per cent of the recruits who took their basic training at this post during the winter of 1954 acquired Adenovirus infection during their first 8 weeks in the Army and only 20 per cent escaped without infection. The Adenovirus infections acquired during this period were almost equally divided between recruits who manifested clinical respiratory disease and those who had inapparent infections or illness so mild that the soldier did not seek medical care. Among those who became sick, roughly half had an illness severe enough to require hospitalization while that of the remaining individuals was relatively mild and was treated on an outpatient basis at the dispensary. Similar studies of recruits who received their basic training

in the summer showed that a much smaller percentage acquired Adenovirus infections and only 10 per cent became infected. The relative proportion of patients who were hospitalized with mild or inapparent cases, however, remained roughly the same as during the winter months.

Further investigations by our group to determine the economic importance of Adenovirus respiratory disease in military personnel were conducted by laboratory study of a representative sample of patients with acute respiratory illness hospitalized at Fort Dix, N. J., during the period from June 1954 through May 1955. During this time, approximately 15,000 admissions were recorded, of which about 10,000 were for respiratory disease. Based on the laboratory test results, about 60 per cent of the recruit respiratory disease, or an estimated 6,000 cases, were caused by the Adenoviruses. The hospital stay for such patients may average around 10 days,[16,27] thus resulting in about 60,000 days of hospital care and man-days lost. It has been estimated[30] that the average cost per day for medical care in a station hospital such as Fort Dix is $20.31 and the daily cost per man-day in the service during the first 25 weeks in the Army is $14.65 (excluding the allowance for medical care). Based on these figures, the total cost of Adenovirus disease among the recruits in this single recruit training base at Fort Dix may be estimated to approximate $2,000,000 per year. Added to this are the costs for repeat training and such less tangible factors as the burdens imposed by disruption of the troop training program.

Even though the viruses of the Adenovirus family comprise at least 14 distinct immunological types, only 3 of these, types 3, 4, and 7, have been found important in military populations.[14,21] Among the cases, roughly 40 per cent appear to be caused by type 4, 40 per cent by type 7, and only 20 per cent by type 3 virus. These findings are in marked variance with those found in civilian populations, in which type 3 has been predominant and types 4 and 7 only rarely encountered.[17,24,25] The reason for this difference between military and civilian groups is not known.

PREVENTION

The economic importance of acute respiratory illness caused by the Adenoviruses to the military in time of peace and its more serious consequences during periods of mobilization for war make it expedient that some method be developed for its prevention. Studies to develop an effective Adenovirus vaccine have been in progress in several laboratories. Huebner and associates[31] have reported that volunteers injected with a heat- or formalin-treated preparation of type 3 virus grown in tissue culture developed neutralizing antibody against the agent. Further, this vaccine afforded significant protection against the experimental

disease which resulted from challenge with type 3 virus onto the conjunctivae of the volunteers.

Recently, our laboratory at the Walter Reed Army Institute of Research recorded the development, preparation, and field evaluation of a formalin-killed Adenovirus vaccine prepared from monkey kidney tissue culture.[32] This vaccine contained the two Adenoviruses, types 4 and 7, found predominantly in the military setting. It proved highly effective in the prevention in recruits of acute respiratory illnesses caused by the Adenoviruses.

The field evaluation of the vaccine was made at Fort Dix during the winter of 1955-1956, at a time when more than 90 per cent of all cases of respiratory illness in hospitalized recruits were caused by the Adenoviruses and when the predominant virus types were 4 and 7. The findings (fig. 1) showed, as might be

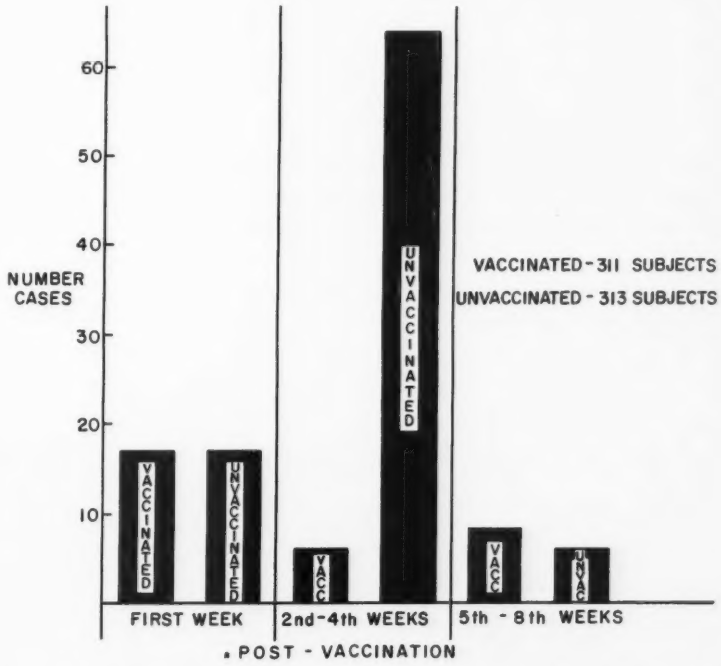

Figure 1. Relation of hospitalizations for acute respiratory illness to time of vaccination.

expected, that the vaccine did not prevent illness during the first week after vaccination. However, during the second, third, and

fourth weeks following vaccination, the incidence of respiratory illness in the vaccinated group was only one eleventh of that in the nonvaccinated controls. After the fourth week, the incidence fell to low levels, and no significant difference was found in the incidence in the vaccinated and control groups. By giving the vaccine as soon as possible after recruits are inducted into the Army, it should be possible to prevent most of the respiratory disease caused by the Adenoviruses which, as previously noted, occurs during the first four weeks of basic training.[29] It should be noted further that most of the cases of acute respiratory disease which occurred among the vaccinated persons were not caused by the Adenoviruses. More recently (unpublished) it was shown that the vaccine effected a 98 per cent reduction in cases caused by Adenovirus specifically.

REMARKS

The discovery of the Adenoviruses (RI-APC-ARD agents) has taken a good-sized bite from the "respiratory pie," and the development of the effective vaccine shows promise of eliminating acute respiratory illness caused by the Adenoviruses as an important problem in military medicine. It should be pointed out, however, that there still remains a large bulk of acute respiratory illnesses of man of unknown cause. The continued application of human cell tissue culture to this problem should lead to the elucidation of the causes and eventual control of other respiratory diseases, the causation of which is presently unknown.

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TOXIC EFFECTS OF CHLORPROMAZINE

Hepatitis and Agranulocytosis

WALLIS L. CRADDOCK, *Lieutenant Colonel, MC, USAR*

IN ADDITION to the milder side effects of chlorpromazine (Thorazine, Largactil), serious reactions may occur. Because of the hazards involved and the seriousness of the hepatitis and agranulocytosis that may result, it is essential that the present status of these events be reviewed.

CHLORPROMAZINE JAUNDICE

Enough well-documented cases of intrahepatic cholestatic jaundice from chlorpromazine have now been recorded to establish definite conclusions regarding the association of obstructive jaundice and the drug. A summary of earlier reports (through 1955) supported by liver biopsy and liver function studies appears in table 1. These cases illustrate the varied aspects of the problem. Of course, many more reports of probable chlorpromazine-induced jaundice have been published, but most of these have not been satisfactorily studied to rule out the possibility of concurrent exposure to other hepatotoxic or icterogenic agents or conditions. Laparotomy was performed in the earlier reported cases when the relationship of the drug to the jaundice was not clearly understood. The differential diagnosis is no longer as difficult, since the characteristic histopathologic features in this type of jaundice are now established and eosinophilia is often a companion finding. The lesion resulting from chlorpromazine administration is unlike that encountered in the livers of patients developing jaundice from external biliary obstruction. Evidence of stasis of bile is invariably found in the central portions of the hepatic lobules, whereas in jaundice resulting from external biliary obstruction, plugs of bile pigment may be found in any portion of the lobule, including the periphery.[1]

Determination of the serum aminopherase (transaminase) activity gives an index of liver cell injury, aids in ruling out the

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presence of viral hepatitis, and indicates impending liver failure. The fact that increased transaminase activity has been found to precede the development of jaundice resulting from chlorpromazine suggests that the transaminase test may be used as a tool to anticipate, and thereby prevent, toxic hepatitis in patients who receive this potentially hepatotoxic drug.[2] This test appears to reflect the degree of hepatocellular damage more closely than the flocculation tests, serum cholinesterase and alkaline phosphatase activities, and other tests of liver dysfunction.

Although many chemicals are known to produce hepatic necrosis, the changes in the liver resulting from chlorpromazine administration simulate those seen in hepatitis induced by methyltestosterone and arsphenamine, with little or no evidence of hepatic cellular damage. Unlike other toxic injuries of the liver due to infectious agents (including viral hepatitis), halogenated hydrocarbons, and arsenic, hepatic injury resulting from chlorpromazine is usually mild, with minimal cellular degeneration and necrosis of individual central cells. There appears to be primary injury of the small biliary passages which become plugged with bile ("thrombi") and surrounded by an inflammatory exudate of polymorphonuclear leukocytes, eosinophils, and lymphocytes in the portal area.

It is interesting that the jaundice may occur several weeks after withdrawal of the drug,[3] and icterus has lasted for seven weeks after only 50 mg of chlorpromazine was given.[4] In cases of obstructive jaundice in which careful questioning of a patient discloses recent intake of even small amounts of chlorpromazine, operation should be deferred until a complete investigation is made to rule out the possibility of chlorpromazine-induced icterus. When cholelithiasis and cholecystitis are recorded in the history, it would be well to avoid the use of chlorpromazine because of the possible diagnostic confusion that may ensue in the hypersensitive patient. Although the jaundice may persist for over six months after drug withdrawal,[5] there appears to be no residual hepatocellular damage, but further study may alter this view. Several clinicians believe that there may be a greater susceptibility to jaundice in patients with histories of liver disorders. In some cases the drug has been restarted without recurrence of the jaundice, but it is inadvisable to again give the drug. Sparine (brand of promazine) can be given if a patient has previously been sensitive to chlorpromazine, as jaundice attributable to the administration of this newer phenothiazine compound has not been seen.

Although the seat of the reaction appears to be in the portal area, experimental evidence strongly suggests that the drug produces stasis in the biliary tree due to an increase in the resistance of the choledochoduodenal sphincter,[6] thus depressing

TABLE 1. *Summary of reports of chlorpromazine jaundice supported by liver biopsy and liver function studies (1954-1955)*

Author	Case no.	Chlorpromazine		Maximum serum			Eosinophilia (per cent)	Weeks of icterus	Remarks
		Daily dosage (mg)	Duration of treatment (days)	Bilirubin (mg/100 ml)	Alkaline phosphatase (B. U.)	Cholesterol (mg/100 ml)			
Lemire & Mitchell[18]	1	200	23	(Ict. Ind. 106)	17.3	-	7	6	
	2	100	15	48.6	10.8	250	17	8	Laparotomy done in all 3 cases. All had severe pruritis but no chills, fever, vomiting, or malaise.
	3	50	31	8.1	36.0	584	Absent	6	
Boardman[19]	4	Up to 500	21	23.0	25.0	-	Absent		Death. Autopsy findings supported diagnosis of "toxic hepatitis."
Zatuchni & Miller[20]	5	75	14	13.7	10.0	461	Absent	4	Laparotomy.
Movitt, et al.[12]	6	100	28	21.0	13.0	325	Absent	3	Laparotomy.
	7	50	30	26.0	32.0	610	Absent	6	Needle biopsy. Transient splenomegaly present.
	8	125	22	6.7	20.0	304	Absent	2	Needle biopsy.

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TABLE 1. *Summary of reports of chlorpromazine jaundice supported by liver biopsy and liver function studies (1954-1955)*—Continued

Author	Case no.	Chlorpromazine		Maximum serum			Eosinophilia (per cent)	Weeks of icterus	Remarks
		Daily dosage (mg)	Duration of treatment (days)	Bilirubin (mg/100 ml)	Alkaline phosphatase (B. U.)	Cholesterol (mg/100 ml)			
Sussman & Sumner[4]	9	50 (single dose)	-	14.0	9.0	-	Absent	7	Needle biopsy. Apparent acute hypersensitivity; 2 hours after repeat dose of 38 mg, severe systemic symptoms with recurrence of jaundice.
Van Ommen & Brown[21]	10	75	21	18.8	16.6	276	42; 6 after 13 days	11	Needle biopsy; no response to ACTH therapy.
Gold, et al.[9]	11	75	21	10.0	24.0	539	16	3	Needle biopsy.
	12	75	14	10.3	22.0	353	5	3	Needle biopsy.
	13	75	25	*2.5	*51.0	*1768	Absent	6	*Tests not done until 3 weeks after onset of jaundice. Needle biopsy.
Hodges & LaZerte[15]	14	50	28	15.95	7.7	325	4	2	Death. Liver biopsy showed chlorpromazine hepatitis. Agranulocytosis also complicating feature. (See table 3)

TABLE 1. *Summary of reports of chlorpromazine jaundice supported by liver biopsy and liver function studies (1954-1955)*—Continued

Author	Case no.	Chlorpromazine		Maximum serum			Eosinophilia (per cent)	Weeks of icterus	Remarks
		Daily dosage (mg)	Duration of treatment (days)	Bilirubin (mg/100 ml)	Alkaline phosphatase (B. U.)	Cholesterol (mg/100 ml)			
Kelsey, et al.[10]	15	400	21	4.2	14.0	-	Absent	8	Liver biopsy.
	16	200	14	5.4	17.6	-	Absent	2	Liver biopsy.
	17	30	12	5.0	17.8	-	Absent	7	Liver biopsy.
	18	Not stated		7.7	13.5	-	Absent	3	Laparotomy.
	19	40	20	11.4	9.3	269	Absent	3	Liver biopsy.
	20	800	30	7.0	42.0	-	Absent	6	Drug discontinued 10 days before jaundice. Liver biopsy. BUN 133 mg.%, became normal at 4 weeks. Abnormal serum protein, TT and CC floc. persisted.
	21	40	5	11.9	19.4	-	Absent	11	Previous cholecystitis. Liver biopsy. Splenomegaly. Liver function remained abnormal (normal function day of starting chlorpromazine). BUN 45 mg. %, became normal at 2 weeks.

TABLE 1. *Summary of reports of chlorpromazine jaundice supported by liver biopsy and liver function studies (1954-1955)*—Continued

Author	Case no.	Chlorpromazine		Maximum serum			Eosinophilia (per cent)	Weeks of icterus	Remarks
		Daily dosage (mg)	Duration of treatment (days)	Bilirubin (mg/100 ml)	Alkaline phosphatase (B. U.)	Cholesterol (mg/100 ml)			
McHardy, et al.[22]	22	40	17	6.5	19.1	-	7	3	Patient had an "allergic tendency" which may have indicated hypersensitivity. Laparotomy.
Redeker & Balfour[3]	23	100	4	-	8.4	-	Absent	5	Liver biopsy.
	24	150	5	-	5.1	-	Absent	8	Onset of jaundice 1 week after drug stopped.
Stacey, et al.[5]	25	75	20	40.0	16.0	900 (xanthelasma)	Absent	4	Death. Rupture of liver. Liver biopsy showed characteristic changes. (Patient treated for postpartum psychosis.)
Arber & Corbett[23]	26	100	20	15.2	20.0	330	Absent	12	History of cholelithiasis. Chlorpromazine given after cholecystectomy. Re-operated on to explore common duct—no stones. Liver biopsy at operation.

duodenal motility. That jaundice is apparently not the result of direct toxic action of chlorpromazine on the liver[7] is supported by the demonstrated lack of correlation between the amount of drug ingested and the occurrence of jaundice, the absence of liver damage in patients who have taken large amounts of the drug in suicidal attempts, the failure to induce liver damage in experimental animals, and the observation that in some patients jaundice is not apparent until some time after the drug is stopped.

The cause of the transient eosinophilia (as high as 42 per cent) is unknown. We have observed eosinophilia in several patients receiving chlorpromazine who did not develop jaundice, but one patient became jaundiced after eosinophilia had been present for about one week. Steroid or corticotropin (ACTH) therapy does not appear to affect the clinical course of chlorpromazine jaundice, in contrast to the prompt and striking response to intravenous ACTH therapy often demonstrated in cases of cholestasis of viral origin.[8] Concomitant administration of other drugs such as large doses of estrogens and Atabrine (brand of quinacrine hydrochloride) might predispose to liver damage from chlorpromazine.

Jaundice occurs in about one per cent of patients treated with chlorpromazine in mental hospitals. Usually they are not very sick, and they experience less fatigue than patients suffering from other forms of hepatitis. Nevertheless, it must be emphasized that there have been several fatal cases of hepatitis implicating the drug. The jaundice may develop insidiously or there may be an abrupt onset of mild flulike symptoms with or without fever. A program of bed rest and special diet is unnecessary. Despite the hepatitis, electroconvulsive therapy has been given during the period of jaundice without any apparent ill effects. The liver is usually slightly enlarged but nontender. Transient splenomegaly has been reported. The results of the liver function tests are similar to those obtained in patients with obstructive jaundice, with significant elevation of serum alkaline phosphatase and transaminase activity and often high values of serum total cholesterol. The alkaline phosphatase may remain high after the serum bilirubin and cholesterol return to normal. A very high cholesterol level was reported in one case (1,768 mg per 100 ml); in this instance the hyperlipemia may have been due in part to the diabetes and renal disease that complicated the hepatitis.[9] However, the serum cholesterol returned to normal after the jaundice disappeared. There has been no evidence of disturbed porphyrin metabolism from chlorpromazine in the cases we have studied.

Another interesting observation is the elevation of blood urea nitrogen recorded in 8 of 12 cases reported by Kelsey and associates,[10] the levels ranging from 20 to 130 mg per 100 ml. In one

patient known to have azotemia at the time of drug administration, the blood urea nitrogen rose from 60 to 130 mg per 100 ml in a two-week period. During this time he developed jaundice. This suggests the possibility that impaired renal excretion of the drug might play some role as a cause of hepatic injury.

Because evidence of functional hepatic impairment in patients on chlorpromazine therapy has been demonstrated by liver tests in the absence of jaundice (in 50 per cent of the cases reported by Lehman and Hanrahan[11]), it may be wise to carry out such laboratory procedures in all patients receiving large doses of the drug over prolonged periods.[12] In one study[5] 100 patients treated with chlorpromazine were followed by serial determinations of the alkaline phosphatase activity. The drug was discontinued when the concentration exceeded normal. In this group only one patient developed jaundice.

A review of the cases of jaundice due to chlorpromazine reported in the literature through 1955 reveals the data to be rather inadequate for excluding the possibility of concurrent exposure of the patient to other hepatotoxic or icterogenic agents and conditions. Criticism pertains particularly to the cases in which no histopathologic studies were done. Five cases of chlorpromazine jaundice have been carefully studied at our hospital. The transaminase activity in all cases followed the pattern seen in extrahepatic obstructive jaundice. The electrophoretic pattern of the serum proteins was undisturbed. In one case jaundice did not appear until three weeks after the drug was stopped; a total dose of 1.1 grams of chlorpromazine had been given in a dosage of 0.25 gram daily.

The laboratory data in one of our cases are summarized in table 2. All cases have been followed in similar manner. The histopathology report of a biopsy specimen of the liver in this case was: "Periportal area shows minimal fibrosis with lymphocytes, eosinophils, and polymorphonuclear leukocytes. There is also a mild focal necrosis of some periportal hepatic parenchymal cells. Some sections disclose inspissated bile plugging tiny canaliculi. Proliferation and distortion of small bile ducts are evident." Biopsies of liver specimens performed in the other cases showed similar findings.

An additional patient was studied at another hospital.[13] Jaundice began more than three weeks after stopping chlorpromazine; only 0.025 gram of the drug was given daily for six days. Serum bilirubin was 14 mg per 100 ml and alkaline phosphatase was 34 Bodansky units when laparatomy was done, although blood eosinophilia of 32 per cent suggested drug-induced icterus. No gross pathologic lesions were seen at operation, but a biopsy specimen of the liver showed the characteristic features described in chlorpromazine hepatitis.

TABLE 2. *Laboratory data: Case report of chlorpromazine jaundice**

Year 1955	12-8	12-12	12-14	12-16	12-19	12-21	12-23	12-27	12-30
Icteric index	20	85		50	25		15	10	6
Bilirubin, mg/100 ml									
1 minute	1.5	4.5	6.3	5.15	3.0		1.1	0.8	0.5
30 minutes	2.2	6.0	8.8	7.2	4.0		1.8	1.25	0.7
White blood cell count	5,100	14,600	16,900	13,600	15,500	10,500	11,000	9,600	9,200
Per cent eosinophils	12	13	10	8	10	5	2	3	2
Erythrocyte sedimentation rate	23		33	25		37			24
Cholesterol (total) mg/100 ml		330		327	337		250		
Cholesterol (esters) mg/100 ml		240		240	170		170		
Cephalin cholesterol flocculation		Neg			Neg				Neg
Thymol turbidity		0.8			0.8				0.8
Cholinesterase		75% of normal			Normal				
Alkaline phosphatase (Bodansky units)	4.2	6.3	6.7	6.7	5.5			3.1	
Serum proteins:									
Albumin (g/100 ml)		4.9		4.8	4.8				5.0
Globulin (g/100 ml)		2.2		2.2	1.9				2.4
Total (g/100 ml)		7.1		7.0	6.7				7.4
Protein electrophoresis			Normal pattern						Normal pattern

TABLE 2. *Laboratory data: Case report of chlorpromazine jaundice**—Continued

Year 1955	12-8	12-12	12-14	12-16	12-19	12-21	12-23	12-27	12-30
Transaminase activity (SGO-T) in units			150 (normal 5-40)			70			20
Bromsulfalein excretion 45 min/5 mg								5.5% retention	
Fecal urobilinogen mg/24 hr		1.0				68.0			
Urine:									
Bile (mg/24 hr)	2+	4+	3+	1+	–	–	–		
Urobilinogen (mg/24 hr)		0.02		0.06		4.0			
Porphobilinogen	neg	neg		neg		neg			
Serum amylase			354		304		180		
(control) in units			180		156		156		

*Liver biopsy performed on 12-12-55.
X-ray chest (12-8-55), flat plate of abdomen (12-12-55), and cholecystogram (12-19-55): all normal.
Urinalysis remained within normal limits except for biluria; hct. bleeding time, coagulation time, prothrombin activity, electrocardiogram: all normal.
Fasting blood sugar (true), 80 mg/100 ml; blood urea nitrogen, 11 mg/100 ml (12-12-55).

AGRANULOCYTOSIS FROM CHLORPROMAZINE

The possibility that patients treated with chlorpromazine may develop agranulocytosis is not as widely appreciated as it should be, since this serious complication occurs much more seldom than chlorpromazine jaundice. Fever, jaundice, and skin eruptions during the early weeks of treatment should be taken as danger signals and compel repeated examination of the blood, if not withdrawal of the drug.

Ulcerative stomatitis, particularly if it occurs at about the sixth week of treatment, should be an absolute indication for the immediate cessation of therapy.[14] One case concerns a patient in whom jaundice was followed by agranulocytosis and death.[15] A causative relationship in this case between the administration of chlorpromazine, subsequent jaundice, and agranulocytosis can only be assumed. The circumstantial evidence, however, is strong in view of accumulating reports. The earlier reports are summarized in table 3.

The mechanism of the production of agranulocytosis and the therapeutic approach to this disorder are discussed in a review by Rotstein, Frick, and Schiele.[16] It is suggested that chlorpromazine agranulocytosis occurs within eight weeks after the drug is started, and most cases to date have occurred in patients over 50 years of age. Unpublished reports of agranulocytosis attributed to use of chlorpromazine total more than 50 cases with at least 17 deaths.[17] At the rather alarming rate these cases are accumulating, the drug may come to rank as an offender comparable to chloramphenicol, the thiourea derivatives, several antiepileptic drugs, and many other new drugs known to cause fatal agranulocytosis.

SUMMARY AND CONCLUSIONS

A study has been made of the better documented reports of chlorpromazine jaundice and agranulocytosis. The important features of these complications have been reviewed.

Chlorpromazine-induced jaundice is of the intrahepatic cholestatic type, and there is usually no associated hepatocellular damage. Nevertheless, several deaths from chlorpromazine hepatitis have been reported. Since the clinicopathologic syndrome of primary intrahepatic cholestasis may have diverse causes, the jaundice may offer considerable difficulty in differential diagnosis. Jaundice may occur several weeks after discontinuing the drug, and it may persist for many months, irrespective of the amount of drug given. In cases of obstructive jaundice in which careful questioning of the patient discloses recent intake of even small amounts of chlorpromazine, operation should be deferred until a complete investigation is made to rule out the possibility of drug toxicity. The transaminase test is valuable in excluding

TABLE 3. *Agranulocytosis associated with chlorpromazine administration (1954-1955)*

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Author	Case no.	Chlorpromazine			Lowest white blood cell count	Differential (per cent)	Bone marrow examination	Remarks
		Daily dosage (mg)	Total dosage (grams)	Duration of treatment (days)				
Boleman[24]	1	280	6.0	60	500	100 leukocytes	Aplastic marrow	Death 2 days after onset of diarrhea, fever to 105°F, increasing pulmonary edema. (Small doses of phenobarbital had also been given. A few cases of agranulocytosis from phenobarbital have been reported.)
Hodges & LaZerte[15]	2	50	1.4	28	4,900	99 leukocytes 1 monocytes	Hypocellular	Death. Exploratory laparotomy one week prior to death because of possible "surgical" jaundice. Biliary tract and adjacent organs normal. Liver biopsy characteristic of chlorpromazine hepatitis. ACTH given after onset of jaundice and prior to agranulocytosis without benefit.
Lomas[25]	3	250-300	6.0	21	680	89 leukocytes 11 neutrophils	Not done	Recovery after 5 days. Cortisone used in addition to antibiotics.
Munch-Petersen[26]	4	200-250	10.8	48	800	86 leukocytes 14 neutrophils	Not done	Recovery after 9 days.

TABLE 3. *Agranulocytosis associated with chlorpromazine administration (1954-1955)*—Continued

Author	Case no.	Chlorpromazine			Lowest white blood cell count	Differential (per cent)	Bone marrow examination	Remarks
		Daily dosage (mg)	Total dosage (grams)	Duration of treatment (days)				
Giacobini & Lassenius[27]	5		Not stated		900	78 leukocytes 22 neutrophils	Not done	Recovery after 40 days.
Tasker[14]	6	75-150	5.5	41	900	95 leukocytes 5 neutrophils	Not done	Death. Clear-cut clinical evidence of chlorpromazine sensitivity (erythema and rash) preceded agranulocytosis by 2½ weeks. No autopsy.
Prokopowycz[28]	7	100-150	5.8	50	1,500	79 leukocytes 20 monocytes 4 myelocytes 6 neutrophils	Not done	Death in 36 hours after onset of agranulocytosis. No autopsy.
Rotstein, Frick, & Schiele[16]	8	75-100	4.0	50	350	100 lymphocytes	Hypocellular with virtual absence of granulocytes	Complete recovery with normal bone marrow 19 days after onset of symptoms. Fall in hemoglobin from 16.0 to 10.8 g/100 ml within 6 weeks after drug started.

the possibility of concurrent exposure of patients to other hepatotoxic or icterogenic agents or conditions. Increased transaminase activity has been found to precede the development of jaundice from chlorpromazine.

During the first two months of therapy it is recommended that a urinalysis be done for bile twice a week, and that frequent white cell counts be made during this period and whenever else indicated, especially when fever, sore throat, or skin eruption suggests the presence of sensitivity to the drug. If the blood serum appears icteric, serum bilirubin, alkaline phosphatase activity, and other liver function studies are indicated, as all cases of toxic reactions should be carefully studied. However, no laboratory data can be substituted for careful, continued, clinical observation of the patient.

It would seem wise to avoid chlorpromazine therapy when infectious hepatitis is endemic, in the presence of liver disease, in malnourished patients, and when other potentially hepatotoxic agents have been used. Sparine (brand of promazine) can be safely given if a patient has previously been sensitive to chlorpromazine.

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RESENTMENT TO ANTIBIOTICS

To those of us who, like Ambrose Pare, believe in the fundamental normalcy of the healing processes in man when tissues are tenderly handled and left so far as possible in their natural state, there is neither need nor justification for the surgeon routinely to divide the responsibility for an intestinal anastomosis between his surgical skill and the antibiotics. We may even wonder if the reaction, mild or fatal, which occasionally follows the use of these agents may not suggest resentment on the part of the body to their interference with a function which it is so well devised to carry out.

—LELAND S. McKITTRICK, M. D.
in *Surgery, Gynecology and Obstetrics*
p. 375, Sept. 1954

PSYCHOLOGICAL COMPARISON OF AUTOMOBILE DRIVERS

Accident- and Violation-Free Versus Accident-Violation-Incurring Drivers

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THE PROBLEM of highway safety, because of the thousands of lives and billions of dollars expended each year in automobile accidents, is one of our foremost social problems. Adequate descriptions of this carnage and waste appear elsewhere.[1-3]

The concept of unequal liability[4] (often referred to as accident proneness) prompted a widespread search for factors which make one person more liable to accidents than another. Most of the earlier studies were concerned with psychophysics, investigating such factors as vision, hearing, reaction time, and co-ordination. More recent research, dealing primarily with sociologic and personality factors as possible correlates of accident frequency,[5-8] has made it apparent that psychophysical measurements of human performance are not adequate for accident prediction even though there are instances in which a statistical significance can be demonstrated.[9]

Previous investigations of personality and biographical factors as related to automobile accidents have likewise produced little evidence that is conclusive in itself, because they were not always carefully controlled. The findings were of enough significance, however, to indicate that this approach to the problem might be fruitful.[5-8] In nearly all of this work a basic difficulty in methods was encountered. Analyzing the many personal and situational factors that must take place in exact sequence for an accident to occur becomes an extremely complex problem. The statistical manipulation of these variables would be an impossible task, since many of them are intangible and cannot be measured adequately.

The hypothesis of accident proneness assumes that a significant number of people have qualities in common that predispose

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them to accidents, and further assumes that these qualities are relatively stable and amenable to measurement. The limited success met by the use of objective-type measuring technics indicates, however, that accident-producing qualities either do not possess these two attributes, or that the technics employed have not been adequate. It would appear, therefore, that if we are to achieve success in differentiating automobile drivers, a new approach must be sought.

The emphasis in the study here reported falls upon the accident- and violation-free group in an attempt to outline personality traits uniformly present in accident-free individuals. There are four reasons why it is logical to study the safe driver rather than the accident repeater: (1) It is the safe driver we wish to select for taxis, buses, trucks, and other vehicles. (2) The accident repeater contributes not more than three to four per cent to the accident problem.[10] (3) The safe driver is more easily defined operationally. (4) Many unsafe drivers do not fall in the accident-repeater classification. The experimental design of this study is based on the assumption that the accident- and violation-free driver belongs to a homogeneous group. That is, prolonged safe driving can be produced only by adhering to a common set of rules and regulations of conduct and therefore must be produced by drivers with similar attitudes and behavior patterns. On the other hand, a person may be accident-prone for as many reasons as there are patterns of maladjustment, and a particular member of the group need not bear any similarity to any other member except in terms of his accident record.

METHOD

Two groups of 67 subjects each, selected and carefully matched by methods previously described,[11] were compared in this study. One group was chosen from Camp Lejeune accident records and consisted of men each of whom had had at least one accident within recent months in which he had also violated a moving traffic regulation. The other group comprised persons whose answers to a questionnaire indicated that they had neither been involved in an accident nor been cited for a traffic violation of any type throughout their driving careers, and who in other ways matched the accident group.

Every subject in each group, as reported in detail previously,[12] received extensive psychometric testing plus a personal interview. From the results of the various tests given, the scores selected for analysis of differences between the two groups were those of the Minnesota Multiphasic Personality Inventory (MMPI), the Bell Adjustment Inventory (Bell), the Kuder Preference Record-Personal (Kuder), and the Rosenzweig Picture Frustration Study (Rosenzweig). These tests, plus the miscellaneous attitude

items, were subjected to item analysis, and the items that differentiated between the two groups by at least a 5 per cent level of confidence were examined for personality, sociologic, and attitude characteristics that would identify the accident- and violation-free driver. Items found to have no particular ability to describe traits of either group were not used in the interpretation.

RESULTS AND DISCUSSION

Table 1 lists those scales of the standardized tests that produced significant differences between the two groups. It is noted that two scales of the MMPI—the Psychopathic Deviate (PD) and the Schizophrenic (Sc)—were significant.[13] This does not mean that the accident group is psychopathic or schizophrenic simply because its score is significantly higher than that of the accident-free group; actually, the scores of both groups lie well within the normal range. It does lend support, however, to the hypothesis that personality tests of this type are capable of differentiating between accident-incurring and accident-free populations.

TABLE 1. *Results of test scales that differentiated between groups*

Test scale	Accident-free group		Accident group		Critical ratio
	Mean	S. D.*	Mean	S. D.*	
Minnesota Multiphasic Personality Inventory					
Psychopathic deviate	15.7610	03.9161	19.4630	04.4800	5.0539
Schizophrenic	08.7460	06.4440	12.0300	08.9363	2.4215
Rosenzweig Picture Frustration Study					
Ego-defensive	59.3000	11.1530	53.3000	10.1700	3.2290
Need-persistence	24.9000	10.3200	30.7000	09.4500	3.3680

*Standard deviation

The Rosenzweig showed significant differences on the Ego-Defensive (E-D) and Need-Persistence (N-P) scales.[14] As with the MMPI scales, the evidence is not sufficient to allow more than speculation as to the meaning of these differences. This is especially true because the Rosenzweig is still in the process of being validated.[15] If one examines the various possible types of response under these two scales, it becomes evident that it is not possible to conclude much about the mode of reaction to frustration for either group, or to infer personality dynamics. It was possible to obtain separate scores based on an item analysis of the Rosenzweig. When the two groups were scored on the basis of these items the scores produced a biserial correlation of 0.53 with the criteria. The results of this work were reported previously.[11]

Item analysis disclosed that about 85 items from the Bell, MMPI, Kuder, and the collection of miscellaneous attitude items were significant to at least the 5 per cent level of confidence (c. r. of 1.96 or more). An examination of these items produced definite and consistent psychological patterns. Thus it became possible to describe some of the traits that tend to be associated with accident- and violation-free behavior on the highway.

When compared with the accident-violation driver, the accident- and violation-free driver shows the characteristics listed in the following tabulation. The figures in parenthesis after each item refer to corresponding items in the Safe Driver Inventory Test.[11]

1. *Is more conservative and moderate in his attitudes*

   a. Less attracted to the use of alcohol. (21, 83)
   b. Less attracted to taverns and liquor parties. (79, 80)
   c. Does not like to see women smoke. (29)
   d. Goes to church more often and is more attached to the church. (9, 81, 82)
   e. Prays more often. (33)
   f. Does not as readily agree that war is necessary under any conditions. (72, 73)
   g. Is more careful whom he trusts. (23, 24).
   h. Does not feel he has to bet on a race or game in order to enjoy it. (14)
   i. Is more concerned over his health. (2)
   j. Is less in favor of socialism. (86)

2. *Is socially more efficient*

   a. Has a greater liking for working with people. (55C, 57B)
   b. Has less difficulty dealing with groups. (70, 56B)
   c. Finds it easier to find interesting things to do. (1)
   d. Has a kinder attitude toward people. (61A)

3. *Is socially more stable*

   a. Doesn't feel like picking fights as often. (8, 10)
   b. Doesn't lose his temper as easily. (22)
   c. Is not as easily upset or apt to take every little thing to heart. (28)
   d. Is happier with his job. (66)

4. *Has more mature outlook*

   a. Isn't as quick to blame others for his troubles. (12, 15)
   b. Isn't as prone to cry over spilt milk. (67)
   c. Has fewer misgivings about the past. (5)

5. *Has different tastes and interests*

   a. Has greater liking for:
      (1) Poetry. (5, 42B)

(2) Growing plants and collecting flowers. (16)
(3) Reading history. (35)
(4) Attending lectures on serious subjects. (30)

b. Has less liking for:
(1) Attending exclusive night clubs. (54A)
(2) Dog and horse races. (42C, 85)
(3) Being an auto race driver. (31)

c. Has greater interest in education and science. (84, 88)

6. *Is more conscientious and ambitious*

a. More willing to accept responsibility. (40C, 51A)
b. Can make decisions more easily. (18)
c. Has a higher aspiration level. (45C, 51C)
d. Sets higher workmanship standards for himself. (34)
e. Is not as easily influenced by other people. (8)
f. Is more concerned with his personal independence. (68)

7. *Had happier childhood*

a. Had fewer arguments with his family. (10)
b. Had fewer impulses to run away from home. (27, 71)
c. Was happier and more productive in school. (3, 20, 26)

8. *Has healthier attitude toward law*

a. Is more ready to believe law helps the common man. (77)
b. Has had less trouble with the law. (25)
c. Is more concerned with staying out of trouble with the law. (19)

9. *Has healthier attitude toward operating a vehicle on the highway*

a. Doesn't believe accidents are mostly due to luck. (76, 78)
b. Believes a good driver must always pay close attention to his driving. (75)
c. Is more willing to share highway with trailer trucks and other vehicles. (74)

In addition to using the statistical method in choosing the significant items, two other criteria can be employed in order to test their validity. The first is to note whether or not there is any contradiction between test items. For example, there were several items concerning the school history and home life of the testee. If these items were chosen by chance only, it is likely that at one point the accident group would have indicated a happier school or home life, but in response to a similar item might have indicated the opposite. One of the two groups might have reported that they prayed more often, yet have indicated a less frequent church attendance; or they might have indicated a greater liking for liquor parties, yet have shown that they used alcohol to a lesser extent than the other group. The list of items chosen do not contain any such contradictions.

The second test is one of chance. Using the 5 per cent level of confidence as a criterion, it can be said that by chance

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alone 5 out of every 100 test items would be chosen as being statistically significant. This presupposes that every item has as much chance of being selected as every other. Because of the heterogeneous nature of the different test items in the original pool and their uneven distribution, this prerequisite cannot be fulfilled. Therefore, if more than the expected number of items were selected as being significant it is a point in favor of the validity of the chosen items; however, if the number of items chosen was less than expected the evidence is not negative.

In general, the chosen items meet the second test, but I do not rely on it as an adequate test and am more inclined to accept the test of intra-item consistency. When these items were placed in test form and submitted to cross-validation groups similar to those used in this study, the results supported their validity.[12] Work done by other investigators also tends to support the conclusions drawn from them.

The characteristics of the accident- violation-free driver, as they have been outlined here, tend to lend themselves very well to that kind of driving behavior that is generally thought to be necessary for accident-free operation. In other words, the results are what one would expect. For example, we would certainly expect the safe driver to have a healthier attitude toward law. The fact that he is a more responsible person and is more conservative in his use of alcohol also logically fits the picture of a safer driver. The fact that he is more intellectually inclined and more at home with ideas equips him better to understand that traffic signs and laws are the attempt of society to protect itself—to understand that group living requires certain responsible behavior.

Because driving upon the highway is essentially an interpersonal situation, we would expect that the person who gets along best on the highway also gets along best with people. It is fitting that our accident- and violation-free driving group should bear the earmarks of better adjustment—a smoother home life and more ease in his relations with people.

Tillman's[7] work agrees with what has been found in this study. Due to differences in the technics used, certain characteristics of the groups are emphasized more in this study than in Tillman's, and there are differences in the kinds of characteristics listed, but in no instance do Tillman's data contradict any of our findings. His high-accident population of taxi drivers is more extreme in their "undesirable" qualities; they seem to be borderline psychopathic deviates. This may be due to the type of population he used for the study and not be a true description of all high-accident drivers.

Tillman's data were gathered by interview technics. He spent three months in informal fashion with the drivers, riding in their

cabs and talking to them between fares. In spite of possible sources of bias (Tillman apparently knew in advance which drivers were in the high-accident and low-accident groups), the method used has the advantage of being able to handle and evaluate many variables at once and is limited only by the skill of the investigator. Unskilled or semiskilled persons cannot apply the technic, and the results do not permit objective analysis. The questionnaire method, as used in this study, is able to circumvent these two objections. Both methods have definite worth, and it is important to note that they yield similar results.

Work by Dunbar[16-18] with hospital fracture cases, utilizing interview, biographic, and Rorschach data, arrived at conclusions compatible with the results of this study and of Tillman's. A preliminary report of work now being done at the University of Colorado[19] indicates that its sample of drivers possess personality characteristics consistent with those reported herein.

SUMMARY AND CONCLUSIONS

Two groups of automobile drivers, each consisting of 67 subjects, were tested and interviewed. One group comprised drivers who in all their driving history had never incurred a motor vehicle violation or been involved in an automobile accident of any kind. The other group was composed of drivers who recently had been involved in at least one accident in which they had incurred a moving violation.

An item analysis of the test items (excluding the Rosenzweig and the sentence-completion test) provided a method of describing certain personality, sociologic, and attitudinal differences between the two groups. It was determined that the accident- and violation-free driver is more mature, conservative, and intellectual in his interests and tastes, has a higher aspiration level, and is the product of a happier family background than is the accident-violation-incurring driver.

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RESEARCH AND THE PUBLIC

"Over the next decade, the public image of science, of medical research, and of the scientist may become more realistic. Research is more widely publicized through newspapers, magazines, radio, and television than at any time in the past. The public's avidity, spontaneous or artificially stimulated, for information on research is remarkable. The emergence of scientific writing for popular consumption as a clear professional journalistic specialty is a most encouraging development for the future. The development of a mature attitude by scientists toward their responsibilities and their rights in communicating to the public is another encouraging factor."

—JAMES A. SHANNON, M. D.
in *Journal of the American Medical Association,* p. 1030, Mar. 24, 1956

A STATISTICAL STUDY OF ALVEOLAR OSTEITIS

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PERRY F. HARRIS, *Captain, USAF (DC)*

ALVEOLAR osteitis has consistently been the most unpleasant and the most frequent single complication following the extraction of teeth. A specific definition for alveolar osteitis (or "dry socket," as it is more commonly known) is lacking in the literature. The clinical entity most commonly diagnosed as alveolar osteitis is generally characterized by one or more of the following conditions: (1) pain, (2) loss of a normal blood clot in the socket, (3) denuded bone surfaces and necrotic material in the socket, (4) delayed healing, and (5) foul odor. A number of causative factors has been suggested and a variety of treatments used. It may be concluded that the cause or causes and mechanism of alveolar osteitis are not yet fully understood. This particular study has been undertaken in order to determine any relevant statistical patterns related to alveolar osteitis as observed among personnel of the U. S. Air Force.

MATERIAL AND METHODS

All data for this study were collected from AF Form 309, Dental Health Record, of U. S. Air Force personnel on active duty. A series of 5,500 consecutive clinical records was screened for recorded cases of alveolar osteitis. No distinction was made as to grade or rank of the patient in the collection of data.

In the series of 5,500 clinical records surveyed, there were found 116 (2.10 per cent) patients in whom alveolar osteitis had been diagnosed and treated. The distribution of cases by age of the patient is not considered significant, as the incidence seemed to be well spread over the age group of men in active military service who required extractions (table 1).

Considerable seasonal variation in the occurrence of alveolar osteitis was observed (fig. 1). The peak of occurrence was reached in March, following a rise through January and February. The month with fewest cases treated is June. Approximately 43 per

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TABLE 1. *Distribution of cases by age of patient*

Age	No. of cases	Age	No. of cases	Age	No. of cases	Age	No. of cases
19	9	28	6	37	1	46	0
20	7	29	6	38	0	47	0
21	4	30	7	39	1	48	0
22	9	31	4	40	2	49	0
23	13	32	3	41	1	50	0
24	7	33	2	42	2	51	1
25	4	34	2	43	1	52	0
26	7	35	3	44	0	53	0
27	5	36	8	45	0	54	1

cent of all cases occurred in the three months' period of January through March. This is usually considered to be the season in which general body resistance is at a low level and upper respiratory infections are active. That the incidence of cases occurring in December is lower is probably due to the fact that many servicemen are on leave and fewer teeth are extracted during this period.

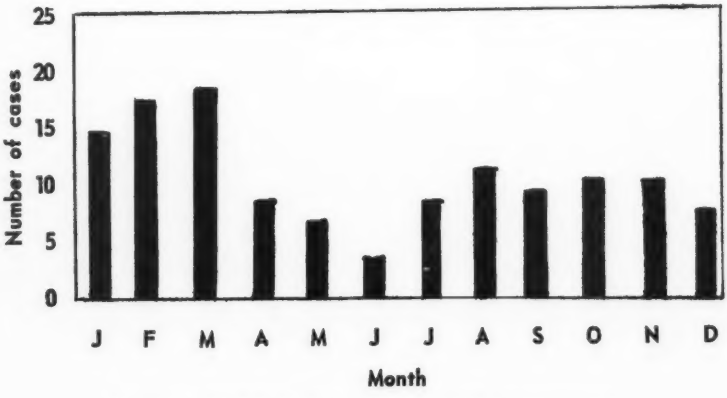
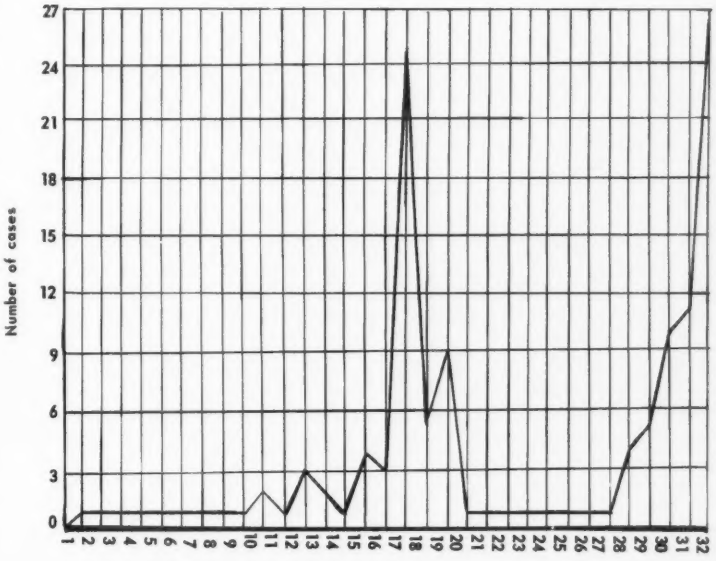


Figure 1. Distribution of cases by month of occurrence.

No cases in conjunction with pericoronal infections in the upper arch were found in this study. All cases of pericoronal

infection studied were associated with lower third molars. Of the total of 51 such cases, 34 (66.7 per cent) were associated with previous pericoronal infection. This fact points up the importance of carefully controlling pericoronal infections before extracting lower third molars.

There is a marked predilection for alveolar osteitis as the tooth location becomes more posterior. The peaks of incidence are in the lower third molar areas (44.0 per cent) with lower molar and bicuspid areas next in order (fig. 2).



*The teeth are numbered 1 through 32, with No. 1 being the upper right third molar; No. 16 being the upper left third molar; No. 17 being the lower left third molar; and No. 32 being the lower right third molar.

Figure 2. Distribution of cases by location of tooth involved.

The removal of lower teeth much more often results in alveolar osteitis. About 84 out of every 100 cases are in the lower arch (table 2). The variation in occurrence between right and left sides is not considered significant.

Alveolar osteitis more often follows a single extraction than a multiple extraction. Of all cases studied, 80.2 per cent were associated with a single extraction. Surgical removal was performed in 34.5 per cent of all extractions, and in 58.8 per cent of extractions in lower third molars. Trauma, therefore, may not

be as important in causing alveolar osteitis as hitherto believed. Sutures were used for closure in 44.8 per cent of the cases studied. The variation between these cases and those in which sutures were not used is not considered significant.

TABLE 2. *Distribution of various findings in 116 patients with alveolar osteitis*

Findings and occurrence		Number of cases
Location	Arch	
	Upper	19
	Lower	97
	Side of arch	
	Right	63
	Left	53
Extractions	Number	
	Single	93
	Multiple	23
	Type, lower third molars	
	Simple (uncomplicated)	21
	Surgical	30
	Type, all cases	
	Simple (uncomplicated)	76
	Surgical	40
Treatment	Sutures	
	Used	52
	Not used	64
	Hypnotics or sedatives	
	Used	20
	Not used	96
	Antibiotics	
	Used	22
	Not used	94
History	Previous lesions	
	Yes	38
	No	78

POSTOPERATIVE PERIOD

The period of time elapsing between extraction and the institution of treatment for alveolar osteitis varied with the individual case (fig. 3). The number of patients returning for treatment rose from the first postoperative day to a peak on the fourth postoperative day. In 70.7 per cent of all cases, treatment was begun by the end of the fourth postoperative day. By the end of the first postoperative week, 95.7 per cent of all patients had returned for treatment.

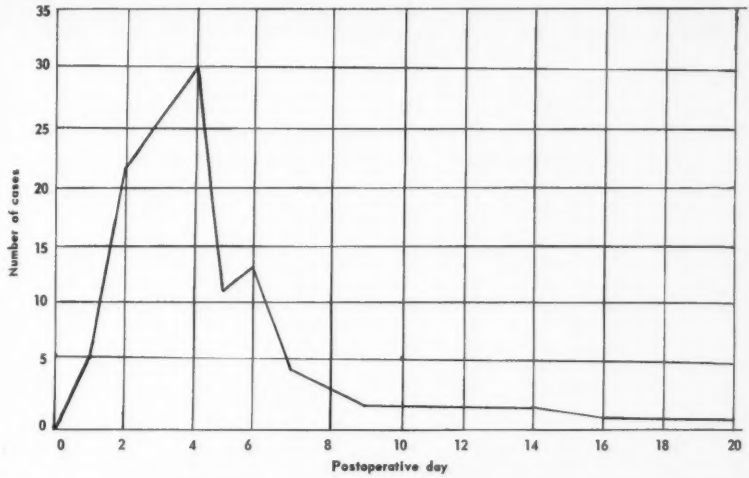


Figure 3. Distribution of cases by postoperative day on which treatment was begun.

The number of days' treatment required varied with the individual case (fig. 4). The peak number of cases was completed by the end of five days of treatment. By the end of one week of treatment 60.3 per cent of all cases were completed. By the end of two weeks of treatment, 87.1 per cent of all cases were discharged without further treatment. A few resistant cases required treatment for from three to four weeks.

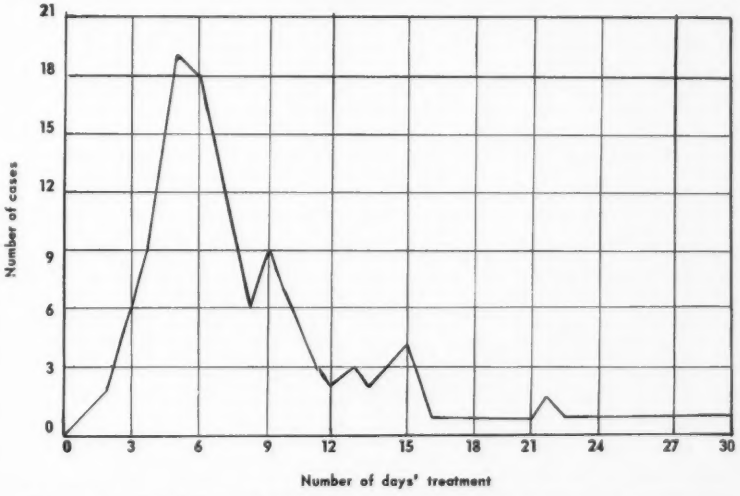


Figure 4. Distribution of cases by the number of days' treatment required.

The prescription of sedatives or hypnotics to control pain and/or induce sleep varied with the needs of the individual patient. Of the cases herein reported, 82.7 per cent required no medication other than the local treatment of the affected socket (table 2). There seems to be no uniformity of opinion among dentists as to the efficacy of systematically administered antibiotics in the treatment of alveolar osteitis. Of the patients studied only 19.0 per cent were given antibiotics as a part of treatment. The sample reflected in this survey on this point is not sufficiently great to justify any conclusions. About 33 per cent of the patients considered in this study had previously been treated for alveolar osteitis. This seems to indicate that certain patients have a greater tendency to develop an alveolar osteitis than do others.

Although the interrelation of the various dental diseases is not well understood, there appears to be a direct correlation between the incidence of alveolar osteitis and other forms of dental disease, with osteitis tending to occur in mouths where other diseases are active. The 116 subjects of this study who had alveolar osteitis also had, on the average, 2.3 decayed, 6.0 missing, and 7.7 filled teeth.

CONCLUSIONS

A statistical study of alveolar osteitis has been presented in which the incidence of this postoperative complication has been correlated with reference to a series of some 15 variables. It may be concluded that alveolar osteitis does follow certain patterns within limits as described. The whole subject of alveolar osteitis is deserving of further study in order that our methods of prevention and treatment be improved.

CARCINOMA OF THE BREAST

More than 16,000 women die annually of carcinoma of the breast in the United States, and its incidence is increasing at the rate of one percent. However, the present outlook is not so discouraging when it is realized that 10,000 of the deaths could be prevented if the disease were treated in the early stages. The education of women to a correct method of examination every month and emphasizing the necessity of reporting to their physicians every six-months, or at any time a suspicious lesion occurs, is a big step forward.

—RALPH A. MC GILL, M. D.
in *Journal of the International College of Surgeons*, p. 42, Jan. 1954

THE QUANTITATIVE INTERPRETATION OF BALLISTOCARDIOGRAMS

A New Approach

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BALLISTOCARDIOGRAPHIC interpretation continues to suffer from the lack of a truly objective basis for analysis. As the subjective element infiltrates the evaluation, there is considerable variation in the final grading of any tracing. The frequency with which disagreements in interpretation arose in our clinic prompted the development of a grading system whereby a relative number of points are assigned to each abnormal constituent of the complexes. This point system of evaluation greatly reduced the subjective error which produced most of our discrepancies.

MATERIAL AND METHODS

The machine used in this clinic is a direct photoelectric ballistocardiograph employing an electrical filter to eliminate respiratory swing, recording through a photographic electrocardiograph equipped with an R wave injector.

Two hundred tracings from men found physically acceptable for military service were used to determine normal values for the length of the I-J segments. The lengths of I-J in inspiration and expiration were determined separately.

Our determined mean for I-J in inspiration was 10.1. The median was 9.5. Standard deviation determined from the sine curve plotted was ±2.75.

Similar measurements for I-J in expiration gave a mean of 7.5, a median of 7.0, and a standard deviation equal to ±2.1.

The importance of these determinations is discussed below.

METHOD OF GRADING

We consider the following in evaluating a ballistocardiogram:

1. Time of onset of H wave after R wave

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2. Time of occurrence of J peak after R wave
3. Respiratory variation in the lengths of I-J segment
4. Lengths of I-J in inspiration and expiration
5. Height and configuration of H wave
6. Depth and configuration of I wave
7. Configuration of J wave
8. Depth and configuration of K and M waves
9. Height of L and N waves

Normal variations of each of these factors were determined by our own experience and the reported findings of others. As suggested by Starr,[1] it was necessary to determine the limits of normal for length of I-J segments for our own particular type of machine (see above).

The following are considered abnormal for each component:

1. Onset of H wave more than 0.04 second after the R wave
2. Peak of the J wave less than 0.20 second or more than 0.26 second after the R wave
3. A variation of more than 50 per cent between the tallest and shortest I-J segment
4. An I-J in inspiration less than 7.5 mm in length or an I-J in expiration of less than 5.5 (for males)*

Points assigned each abnormality are relative to the importance of that portion of the cardiac cycle which the component represents. Points are assessed against a single component only once, regardless of the number of complexes in which it is abnormal (*e. g.*, 1 point is assessed if H is abnormal in all complexes or only in expiration).

1. Abnormal H timing	1 point
2. Abnormal J timing	1 point
3. Abnormal respiratory variation	2 points
4. Small I-J in inspiration	4 points
Small I-J in expiration	2 points
5. Abnormal H waves present	1 point
6. Abnormal I waves present	1 point
7. Abnormal J waves present	1 point
8. Abnormal K or M waves present	1 point each
9. Abnormal L or N waves present	1 point each

The final grade assigned any tracing is determined by the addition of the points assessed, thus:

Normal	not more than 1 point
Grade I	2, 3, or 4 points
Grade II	5 or 6 points
Grade III	7 or more points

*The exact range of normal for I-J segments of females is presently being determined.

Grade IV tracing so bizarre that waves cannot be identified for measurement

DISCUSSION

The grading of ballistocardiographic tracings by this method was compared with those involving the determination of the percentage of abnormal complexes. Four hundred tracings were originally graded by the method of Brown, Hoffman, and de Lalla,[2] prior to the adoption of the point system in our clinic. These were then re-evaluated according to the point system.

In 78 per cent of the tracings which were cross-graded, there was no change in the assigned grade. As was expected, *no* tracing which was *seriously* deranged improved in grade by any method of evaluation. For example, no Grade IV tracings were upgraded, and only rarely was a Grade III considered to be Grade II.

Of the records, 16.8 per cent were given an improved grade by the point system. The tracings in this group created the most arbitration in our clinic. They consisted primarily of tracings given a poorer grade by percentage determination of normal. For instance, an I to J ratio less than 1:2 or a tall H wave made it necessary to consider many otherwise normal complexes as being abnormal. Usually these tracings were taken from persons in excellent physical condition as determined by history, physical examination, and laboratory aids. We, therefore, felt justified in assuming that the point system had allowed us to classify these tracings more correctly.

Some 5.2 per cent of the tracings were given a lower grade by our method than had been determined by other methods. These were mainly recorded on males over the age of 40 years. The difference in evaluation resulted from the fact that although the tracing had a regularly recurring pattern and an I to J ratio of 1:2, suggesting a grade of normal, the I-J segments were abnormal according to our standards for I-J segment length. This is a common finding in tracings from persons beyond the fourth decade of life. However, the fact that it is common does not justify a classification of normal for this age. We are in agreement with Dock, Mandelbaum, and Mandelbaum[3] when they state, "Abnormal patterns in the electrocardiogram or in the ballistocardiogram result from abnormal states of the circulatory apparatus, whether the individual is young or old."

The short I-J segments in all age groups primarily suggest degeneration of the myocardial thrust and a compromise in the efficiency of the heart as a pump. We feel, therefore, that this type tracing was not normal and should have been graded down.

SUMMARY AND CONCLUSIONS

In our clinic frequent disagreements arose in interpreting ballistocardiographic tracings using the percentage of abnormal complexes as a criterion for grading. We therefore devised a point system of grading to help eliminate the subjective element. The point system is discussed, including our standards for I-J segment length in inspiration and expiration.

Four hundred tracings originally graded by the method of Brown, Hoffman, and de Lalla were re-evaluated by the point system. In 78 per cent of the tracings the grade was not changed, in 16.8 per cent the grade was improved, and in 5.2 per cent the tracing was downgraded. The reason that a change in grade by the point system seemed warranted is discussed.

The point system of grading which we have presented has been a substantial aid in developing better quantitative interpretations of ballistocardiograms in this clinic. It has been outlined here in the hope that it may benefit others who have had similar difficulties.

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MISINTERPRETATION

Misinterpretation of what the doctor says is so easy for the patient. Many a doctor who has given an explanation on which he prides himself would be disconcerted to learn the retailed version of his carefully chosen words. That is why lucidity is so essential. It is a difficult art to cut one's explanatory coat according to the intellectual cloth provided by the patient, and it must be especially hard for psychiatrists to word their interpretations without ambiguity, because the mind is even harder to explain than the body.

—RICHARD ASHER, M. D.
in *Lancet*, p. 759, Apr. 9, 1955

CLINICAL RECOGNITION OF EARLY AND INSIDIOUS SCHIZOPHRENIA

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EARLY or insidious schizophrenia is not always obvious, even to the experienced psychiatrist, because it may simulate any psychiatric disorder and many organic illnesses.[1,2] The resultant need to stress certain clinical features of schizophrenia became apparent to me through teaching psychiatry to general medical officers at this school and supervising the work of psychiatrists of limited clinical experience.

Although generally slighted in standard textbooks of psychiatry,[3-5] the clinical features discussed in this article have been found to be of special value in detecting early and insidious schizophrenia, as distinguished from "pseudoneurotic schizophrenia," first described by Hoch and Polatin.[6] Although these features may be noted in some patients with chronic or full-blown forms, such patients are adjusting at a definite psychotic level and present little difficulty in diagnosis.

The proper management and treatment of schizophrenic patients depend on prompt diagnosis. As a rule these patients first come to the attention of general medical officers or specialists other than psychiatrists. Unless the diagnosis is suspected, the wide variety of symptoms that these patients present is extremely confusing. They are often misdiagnosed as having organic illnesses, psychoneuroses, or character disorders ("psychopathic personalities"), or are simply dismissed as malingerers.

ANXIETY

One of the most significant and least often recognized indications of schizophrenia is the presence of intense and prolonged anxiety. Both the subjective and objective aspects of anxiety are usually thought to be associated with the psychoneuroses. To many medical officers, complaints of "nervousness" or clinical signs of anxiety automatically signify that the patient is a "neurotic." Actually the neuroses, by their very nature, are defenses against anxiety, and severe anxiety is seldom present in the neuroses for a period of more than a few hours or days. On the other hand, it is often present in early or insidious schizo-

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phrenia. The schizophrenic patient will demonstrate objective evidence of such anxiety: striking tremulousness, widely dilated pupils, flushing, and severe hyperhidrosis. Occasionally widely dilated pupils will be the first clue that a psychotic and not a neurotic condition is present.

Mild or chronic signs and symptoms of anxiety, however, are frequently present in the psychoneuroses, in which anxiety differs qualitatively as well as quantitatively from that in the psychoses. The psychoneurotic patient describes his anxiety as an unknown dread or an incomprehensible but definitely uncomfortable feeling. He is unable to explain why he has such unpleasant sensations and he tells of his resultant feelings of helplessness and exasperation. He will stress that his feelings are "silly" and defy logical explanation, and will seldom speak of his feeling of apprehension as one of "fear."

The schizophrenic on the other hand will describe his anxiety in terms of fear. He will complain of fear of dying, fear that the world is coming to an end, or fear of losing control and killing someone. The total clinical picture will, of course, necessitate consideration in order to arrive at a correct diagnosis.

Although the psychoneurotic himself is unaware of the cause of his anxiety, a detailed description of his present illness and past history will suggest probable dynamic mechanisms and defense patterns. This is illustrated by the case of a very capable but somewhat overly conscientious sergeant who developed a mild anxiety state for several days after having become a warrant officer. From his history it was learned that he had long-standing dependency needs and conflicts concerning responsibility. These were incompatible with his assumption of a position of greater responsibility. The connection between his anxiety and acceptance of a warrant was quite clear, but the patient himself was not aware of the relationship. Contrary to this, the schizophrenic's anxiety will bear little relation to his current life situation. He merely recites his symptoms over and over and no psychodynamic mechanisms are suggested. The somatic components of his anxiety will often be described in a bizarre and inexact manner. In addition, he usually relates many intense feelings, such as great hatred for some member of his immediate family or a multitude of deviant sexual impulses. These are related with little hesitation and accompanied by emotional blandness.

Thus the presence of intense and prolonged anxiety, which shows little relation to current life problems and is described as a specific fear, should alert the physician to the possible presence of schizophrenia.

HYPOCHONDRIACAL SYMPTOMS

Hypochondriacal symptoms in a person less than 35 years old almost always turn out to be a symptom of an underlying schizo-

phrenic process. In older patients they may occur as a manifestation of a hypochondriacal neurosis, involutional melancholia, or other psychiatric conditions. The term hypochondriacal symptom is used here in a specific manner and refers to physical symptoms for which no structural or functional disorder is present. Hypochondriacal symptoms are distinguished from symptoms of conversion reactions (hysterical symptoms) and somatization reactions (psychosomatic symptoms). In both of these reactions there is a demonstrable dysfunction. In the former, the individual attempts to defend himself against anxiety by the production of a symptom with a symbolic meaning. In the latter, anxiety is dealt with by being channelized through one portion of the autonomic nervous system and causing dysfunction of an organ or organ system. By contrast, hypochondriacal symptoms bear no relationship to actual bodily dysfunction and are often described in bizarre terms. There are often associated fantastic ideas concerning a supposed physiologic disturbance. In these instances they approach actual somatic delusions. Hypochondriacal symptoms must be distinguished from odd symptoms or descriptions of symptoms which reflect physiologic and anatomic misinformation or ignorance. A patient may, for instance, state: "I have weak kidneys," but actually mean he has a pain in the back which he assumes is related to some kidney ailment.

A physical complaint may not initially appear to be unusual. As the patient elaborates on his symptoms, however, he reveals their peculiar nature. It may require careful questioning and alertness to recognize a symptom's true significance. For instance, an initial complaint of headache may be elaborated by a statement such as "not really a pain but a feeling like the top of my head is going to blow off; the discharge from my nose indicates that the pressure is causing some outflow of brain substance." In one case an initial complaint of numbness in the arms was later found to have a more complex meaning for the patient. He actually felt that there were bubbles of air in the veins of his arms. Furthermore he believed his symptoms were the result of people trying to poison him. Unlike conversion symptoms or psychosomatic symptoms, hypochondriacal symptoms are not influenced by reassurance, placebos, or explanation.

Any hypochondriacal symptom that occurs in a young person, especially if bizarre, necessitates a careful psychiatric evaluation to consider the possibility of an underlying schizophrenic process.

ALCOHOLISM

Severe alcoholic over-indulgence in a young person should alert the medical officer to the possibility of a schizophrenic process. Occasional use of alcohol in the teens or early 20's is of little significance in itself, but when alcoholic intake is fre-

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quent and results in severe intoxication, an early schizophrenic process must be considered. This is especially true when alcohol is consumed for the purpose of decreasing overt anxiety or marked feelings of inferiority and inadequacy. It is of less significance when used in an effort to decrease mild social anxiety or an effort to prove that one is able to drink and is therefore mature. If a young adult patient gives a history of repeated alcoholic amnesia ("blacking out spells," "pulling a blank"), there is greater likelihood of a severe emotional disorder, which may be a schizophrenic process. Although alcohol allows the schizophrenic to make a temporary adjustment, it further interferes with his reality testing and a definite psychotic picture finally results.

CONVERSION SYMPTOMS

Gross conversion symptoms such as hysterical paralysis of an extremity, hysterical blindness, and epileptoid seizures always suggest the possibility of a schizophrenic process, and when carefully evaluated, the patient with such a symptom is frequently found to be schizophrenic. Unless a patient with a marked conversion symptom falls into one of the following two categories, the author has found it convenient to presume him to be schizophrenic until proved otherwise:*

1. Mentally defective or borderline mentally defective patients: Such patients may develop conversion symptoms when placed in situations with which they are intellectually or emotionally unable to cope.

2. Patients from unique cultural areas: Gross conversion reactions are fairly common in certain culturally backward areas of the United States and are well known in Puerto Rico. The frequency of bizarre epileptoid convulsions among Puerto Rican patients is common enough to have been labeled the "Puerto Rican syndrome" by some psychiatrists.

Many specific instances are known where improper management resulted from failure to recognize the basic schizophrenic process in patients who presented conversion symptoms. The consequent occurrence of acute severe psychotic episodes required electroconvulsive treatment and prolonged closed ward care. In some cases the patient failed to regain even his previous level of adjustment.

PLASTIC SURGERY CANDIDATES

Patients who request facial plastic surgery in the absence of actual or significant disfigurement are frequently schizophrenic. This is especially true of those who seek operations for plastic surgery on the nose. The intense desire they express for such

*This is not intended to imply that there is no diagnostic entity of conversion reaction. It is beyond the scope of this article to discuss conversion reactions per se.

operations is not reduced by careful explanation regarding the indications for plastic surgery and its limitations. Their desire for correction of minor or nonexistent disfigurements are actually early feelings of depersonalization and withdrawal from reality. Plastic surgery may precipitate a full-blown psychotic reaction in early or insidious cases of schizophrenia.

TINNITUS

Occasionally a chief or sole complaint of ringing or buzzing in the ears in the absence of demonstrable organic cause may be the only indication of a schizophrenic process. Such ringing or buzzing in the ears precedes the development of auditory hallucinations and other indications of an overt psychosis. Patients often disclose that the ringing resembles a rumble of voices but that they have been reluctant to report this to the medical officer. If the underlying schizophrenic process is unrecognized, repeated unrewarding special examinations result.

SUMMARY

A few clinical hints have been given for the early recognition of schizophrenia. Teaching experience has shown that the significance of certain symptoms and signs are not universally recognized and are not stressed sufficiently in standard textbooks of psychiatry. None of the symptoms or signs mentioned are in themselves pathognomonic of schizophrenia. They should, however, alert the medical officer to the possibility that he is dealing with a basic or underlying schizophrenic process. All too frequently, patients who have early or insidious forms of schizophrenia are not recognized and are mismanaged. Often the result is repeated needless laboratory work or consultations. Sometimes mismanagement results in severe schizophrenic reactions which require prolonged hospitalization and treatment. Most unfortunate are the acts of violence and the suicides that may occur.

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PROJECTIVE SOUND TESTING OF EMOTIONALLY ILL PATIENTS

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OBJECTIVE psychologic studies of sound perception and sound association have been few, compared to the many studies of visual perception. Particularly great emphasis in psychologic testing has centered upon the Rorschach and Thematic Apperception Tests, but what is seen and how something is seen is no more important than what is heard and how something is heard.

In general, two types of sound association experiments have been reported in the literature. Skinner[1] described a verbal summator, later called the tautophone. This is a device for repeating arbitrary samples of speech obtained by permuting and combining certain elemental speech sounds. The repetition of samples may evoke various associations. This method for studying latent speech and projection was then utilized clinically by Shakow and Rosenzweig.[2] Stone[3] presented an auditory apperception test to elicit responses in story form. Here subjects were instructed to write or tell the story based on the sounds they heard. More recently, Davids and Murray[4] reviewed the literature and presented their "azzageddi" test, which deals with interpretations of direct statements or projections that the subject culls forth.

A study of sound associations that we pursued during the past five years resulted in the development of a series of 21 carefully selected sounds, each lasting from 20 to 50 seconds. These were recorded on two records, which are available to others for research purposes.* Descriptions of how the sounds were obtained from real life and how they were selected and recorded have been published elsewhere.[5-7]

This article reports certain features from the responses to these stimuli by Navy and Marine Corps patients from the psychi-

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atric service in this hospital. The sample is a group that was carefully selected, not according to psychiatric diagnosis, but on the basis of a history of recent experiences in which sound played a significant part. By significant sound experiences we mean (1) traumatic events such as explosions, crashes, or gunfire, and personal sound distortions such as hearing defects, organic or hysterical; (2) psychotic sound imagery such as auditory hallucinations in which the sound quality as well as the content was of importance; and (3) unusual sound training necessitated by such service experience as sonar or listening duties, piloting a jet, or serving on a submarine. Each patient then could be thought of, in a measure, as a "sound casualty."

The technic of testing differed from the customary manner in which a psychologic test is given by a specialist. Instead, the sound stimuli were used much as one would use Sodium Amytal, to stimulate anamnestic recall in order to obtain replies to specific questions relating to sound associations and apperceptions. To this end the testing was conducted by the therapist or the would-be therapist. It is of real value that the therapist himself actually hears the patient's response and notes his voice, attitude, and manner, because the insight into a patient's conflict or personality that is obtained is of immediate practical value in his care. The method is thus a device in the physician's armamentarium that may help him to obtain specific answers. This does not mean that extensive quantitative studies should not be simultaneously pursued, as is indeed being done, but that the practical usefulness of the method in treating patients need not depend upon such studies.

THE EXPERIMENT

The sample consisted of 31 Navy and Marine Corps officer and enlisted personnel, ranging in age from 17 to 41 years. All were men, and 23 per cent had participated in combat during World War II, the Korean conflict, or both. All were hospitalized for psychiatric problems, including character disorders, neurotic difficulties, and psychotic states. Three patients were deaf in one ear, 12 had been treated with Serpasil (brand of reserpine), two had had deep insulin coma following early schizophrenic episodes, and at least three were experiencing auditory hallucinations during the time they were studied. Three were qualified submariners, one was a jet pilot, and two were senior naval officers.

The experiment consisted of presenting the patient with a series of 21 sounds—some taken from the environment, such as the radio, home, playground, and railroad station, and some selected from sound tracts of movies. The patients were told:

> You are going to hear a series of recorded sounds. Some of these will be familiar, some strange. All sounds have

associations—they bring memories, stories, thoughts, or feelings to mind. This is true of music, cries, words, et cetera. Sounds have different meanings to different people. We are interested only in the meaning these sounds have for you. Tell me what your first thought is—what comes to your mind—what the sounds tell you. If you wish you may make up a story . . . .

Responses of each patient to each sound were tabulated and analyzed for accuracy of perception, unpleasantness or signs of emotional involvement with particular sounds, the use of sounds to recall personal experiences, and the elicitation of material alien or completely extraneous to the sound stimuli being presented.

Accuracy of Sound Perception. Not only do sounds have associations, but they call forth "sound illusions" or "mishearing" in certain individuals. The illusion is the result of mishearing or misinterpreting real auditory stimuli. Owing to established habits of rapid association or the temporary "set" of the mind, the listener mistakes the actual sound for something different. Total misperceptions of individual sounds ranged from 6 to 13 per cent, the highest being reported on a sound involving an aggressive male and a retaliating female. Here a recorded dialogue between a man and a woman, culminating with the woman declaring, "Well, I wouldn't talk if I were you," was heard variously as "I wouldn't take it if I were you" (by a patient who went on to say that his own wife wouldn't be so quiet in that situation and that he'd rarely say such things to her), as "You certainly had nerve," and as "I wouldn't be ashamed if I were you." Another patient didn't even hear the sentence because he was upset by the preceding material.

In regard to the various sounds involving people, condensations of dialogue occurred, seemingly through selective hearing and the placing together of words that would make the final phrase coincide with the patients' own thinking. Total mishearing of one sound involving a young man calling for help amidst a crowd was observed with three patients, who reported the man as saying, "No." The sound reminded one of these patients of someone thrown to the lions, with people cheering as he was being punished. In relation to sounds involving situations other than people, for instance, the sound of running water with music being played in the background, misperceptions also were noted. One patient interpreted this sound as "still water" and then used this misinterpretation as a springboard for telling about his father's liking for the mountains, his father's desertion, his own guilt at having sided with his mother against his father, and how he felt guilty about this now and consequently had joined the service. Slips of the tongue in reporting the associations also occurred,

as in the following example with the sound just mentioned. A depressed patient whose wife had recently left him, taking their child with her, mentioned he had heard a "sympathy" (symphony), while a patient with claustrophobia heard the sound as "someone in a vase" stirring liquid. When examining the life histories and present difficulties of the patients, their distortions, misperceptions, and slips in interpretations have direct bearing on their individual personalities.

Affective Tone. In analyzing the patients' responses, we were particularly interested in the affective quality of their associations. The protocols were scanned for material explicitly stated by the patient that would reveal his present emotional state. It soon became apparent that unpleasantness or sadness was prevalent in the protocols, and even with such rigidly applied criteria as verbal statements themselves, we found up to 23 per cent of the responses to any one sound eliciting associations of sadness, unhappiness, or depressed states. A somewhat moving sound, produced by a man reciting a sad poem against a background of organ music, elicited associations involving the funeral of a patient's father, an active hallucinatory episode involving an upraised arm about to strike someone, and projections of unhappy themes in radio programs, motion pictures, and church sermons, all with personal reference to sadness. It was found that in general the highest numbers of depressed or sad themes occurred with sounds involving human participation, and were especially apparent in relation to calls for assistance, unhappy states such as crying, and tense states involving arguments and aggressiveness. It is believed that the response to sounds portraying human situations calling for action on the part of the listener revealed the inadequacies for which the patients had had to be hospitalized. Their own ineffectualness in dealing with interpersonal relations was thus mirrored in their associations to the sounds.

Personal Experiences. In many instances the sounds had so much meaning to the patients that direct interpretation was entirely avoided, and the sound became merely a stimulus to recall a personal and sometimes deeply moving past experience. The frequency with which this occurred with each of the 21 sounds ranged from 7 to 26 per cent. As expected, those sounds involving human participation brought forth the greatest number of these experiences. The majority were concerned with early events or those involving the immediate family. A sound of a parent-child conflict stimulated comments such as "My own rebellion against my parents . . . ." "Like me disciplining my oldest boy . . . ." "Just like myself . . . getting beat up all the time . . . ." "We were treated like soldiers in that home . . . . Is that what a home is really like?" (This last patient was raised in an orphanage and to him the sound suggested movie and TV themes of family

life in an actual home.) Another patient recalled, "My Dad talking to me for something I done wrong," and another, "Sounded like my little boy—someone's going to whip him." On a sound involving a man and woman alternately crying, one patient recalled, "Like a crying jag I had in Pearl Harbor . . . ." Another patient responded with, "Reminds me of myself—the voices," and "Like I was in a funeral home."

The power of sounds to bring forth personal experiences that have direct bearing on the illness of the patient is important diagnostically as well as therapeutically. However, it is not known if the sound perception constitutes material unique to this mode of perception—that is, if anything is revealed through this mode that could not easily be gained through interviews or other projective tests involving visual perception.

Extraneous Material. In some of the associations, there were remarks or meanings that seemed to be completely outside the range of the stimulus. At least one such association occurred with each sound. The greatest number (10 per cent) were related to the sound of the parent-child conflict. They occurred mainly in areas where the patient displayed considerable affect, such as disgust, fright, or sorrow. In one case a patient with a hyperalarm reaction asked, "Have you ever noticed the shadow on your wall made by the fan?" He had associated the shadows with the faces of Lincoln and Washington, which was an almost total rejection of the actual sound stimuli. The patient's own history is not lacking in father-son conflict.

Some of the material was set off by the association itself, as if it awakened other memories of the past. Sometimes the patients went on to give personal opinions and reveal wishes, such as: "The old man deserved to have a couple of his arms broken or shot off," and then went beyond the sound in their associations. When presented with a sound of someone walking, one patient recounted his experiences in Korea while another talked of the crying of small children being kicked around.

Extraneous material, either given as associations or stimulated by the sound, plus the association itself, seemed to be related to misperceptions, and in most instances was directly connected with material in the patient's life history.

CASE REPORTS

Two case studies are presented briefly, to illustrate possible applications of sound associations and their meanings in specific sound situations.

Case 1. A Navy pilot was hospitalized with paralysis of the lower extremities. Although his illness was eventually established as a conversion reaction and confirmed by numerous civilian and military con-

sultants, he could not accept the idea that his difficulty could have any psychologic basis, although it had occurred immediately prior to his squadron being sent to sea. His sound associations and behavior during the sound testing offered confirmatory evidence as to the nature of his difficulties and gave even greater insight into the nature of his thinking. The manner in which he reported his associations, using phrases such as, "It's quite obviously . . ." "No question about that one . . ." "I'm sure that was what it was . . ." et cetera, gave indications of his use of rigid, concrete thinking. His rationalizations and denial of emotion supplied further insight into his illness. Typically he stated, "I have no personal associations to the sounds—they do not apply to me," and "I don't suppose you could say that the people were crying . . . ." Qualifying and justifying were too frequent not to have meaning.

Case 2. A young married submariner entered the hospital with a diagnosis of possible epilepsy. He had been in the conning tower of a submarine when an explosion occurred in which several men lost their lives. The patient revealed that he was impressed with the fact that such things could happen, and had conscious fears that an explosion might occur again. He also reported having "accident dreams" following the explosion. His sound associations were replete with specific anxieties concerning space, movement, and threat. The submarine, being the epitome of controlled environmental stress, became a realistic and threatening sound situation.

While submerged, the submariner lives entirely in a compartmentalized sound world, where sound is his only means to gauge reality. Reaction to sound situations (stimuli)—for example, the diving alarm, the surfacing alarm, and sonar pings—are means of expedient communication requiring action more rapid than human verbal means will allow. In an enclosed chamber where there are crowded a fantastic number of instruments and indicators which are the only points of reference to the outside world, a submariner's optimum function requires the epitome of control. In contrast, the aviator lives in a world where visual representations of reality are experienced as well as the sounds of his machine with which he closely identifies himself as he relies on his instruments for his cues to action.

SUMMARY

Sound associations were obtained from 31 Navy and Marine Corps patients, each of whom had had some significant sound experience in his recent life in the military situation. Their responses were analyzed in terms of accuracy of perception, emotional involvement, recall of personal experiences, and elicitation of extraneous material evoked by the sound stimuli. Two cases are presented, illustrating possible applications of projective sound testing.

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THE FUTURE OF MEDICINE

Looking into the future we must admit that healing will no longer be the main task of the physician although still a very important one. Medicine must by necessity become preventive medicine. There is no point in letting people break down and suffer from preventable diseases. There are enough sources of suffering in the world that may not be prevented so easily. The major tasks of medicine will be the maintenance and promotion of health, the prevention of disease, healing when prevention has broken down, and finally the social rehabilitation or reintegration of the former patient into society. The doctor's place will no longer be in his office where he would sit waiting for patients; it will be the factory, the mine, the farm, the ship, wherever people convene for work. His headquarters will be the Health Center. Such a program obviously requires the close cooperation of the physician with educators, physical culturists, social workers, administrators, and statesmen. The relation between medicine and sociology will be a very close one.

—HENRY E. SIGERIST, M. D.
in *International Record of Medicine and General Practice Clinics*
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THE TECHNIC OF CIRCUMCISION USING LOCAL ANESTHESIA

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REDUNDANT prepuce and phimosis produce 26 per cent of all admissions for diseases of the genito-urinary system to Air Force facilities for treatment.[1] The figure for circumcision is not reported concurrently, but it must be presumed that this is the fate of most of the cases in this category. On the basis of these figures it is obvious that several thousand circumcisions are performed annually throughout the military services, and that there is a concomitant high loss of effective manpower. For military expediency, the morbidity involved with the procedure of circumcision, and the attendant period of hospitalization, must be kept to an absolute minimum.

Recently, in a tour of hospitals, I was impressed with the totally unnecessary risks involved in routinely performing a high proportion of circumcisions under spinal or general anesthesia. At these hospitals, the patient is admitted at least one full day prior to circumcision and is kept there for from 5 to 10 days postoperatively, and even longer in the instance of the development of postspinal headaches or aspiration pneumonitis.

It would seem appropriate, then, to describe a simple technic for the performance of circumcision under local anesthesia. The patient can be admitted to the hospital the day of the circumcision and discharged to duty on the following day, with a total loss from duty of only 24 hours. Indeed, several medical officers and medical corpsmen promptly returned to duty following circumcision.

There is nothing original about the technic set forth below. It combines the best parts of several different recommended procedures and has evolved into a reliable procedure with a minimum of technical difficulty. It can be easily performed by any medical officer.

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CONSIDERATIONS

As a preoperative medication, a barbiturate is used to produce psychic sedation and to minimize the minor systemic reactions to local anesthetics, evidenced by apprehension and psychic irritability, which may infrequently occur. For these reasons, 0.2 gram (3 grains) of Seconal (brand of secobarbital sodium) is given orally one hour prior to circumcision. No other premedication is necessary.

A 1 per cent aqueous solution of Xylocaine (brand of lidocaine hydrochloride) has been found to be the anesthetic agent of choice, but when this is not available, procaine hydrochloride may be used with satisfactory results. Xylocaine has the great advantage of having a faster and more prolonged action than procaine, with twice the potency and fewer side effects. For this procedure, a maximum of 15 to 20 ml of the 1 per cent solution is used, and this dosage is well within the limits of safety. Epinephrine is not added because its vasoconstrictor action may result in a bloodless operation, thereby masking small bleeders and increasing the possibility of hematoma formation.

Circumcision sutures should be of interrupted 0000 plain catgut on a small cutting-edge needle. The catgut is readily absorbed and the sutures fall out easily after the wound has healed. A continuous suture would tend to form a noose about the penis, and in the event of an erection produce painful strangulation. Furthermore, should a continuous suture break prematurely, the entire wound would separate.

The nerve supply of the penis is derived from the pudendal nerves which divide on each side into two main branches, the dorsal and the perineal nerves. The dorsal nerves supply the skin on the dorsolateral aspects of the penis and send terminal filaments to the glans. The perineal nerves subdivide into posterior scrotal and muscular branches. The posterior scrotal nerve may send filaments to the ventral portion of the penis.

METHOD

The area is prepared for circumcision by shaving the hair from the region of the base of the penis, then thorough scrubbing with surgical soap, and rinsing off with sterile water, followed by a 1:1,000 aqueous solution of Zephiran (brand of benzalkonium chloride). Alcoholic solutions of Merthiolate (brand of thimerosal) are not used because these can be highly irritating to the sensitive skin of the scrotum. If the prepuce cannot be retracted to clean the glans, this is done as soon as the glans is exposed by the dorsal slit.

The dorsal nerves are blocked on each side at the lateral aspect of the base of the penis. Using a 23-gage needle, a skin wheal

is raised, and then the needle is inserted perpendicularly through the subcutaneous tissues until a definite sense of tissue resistance is felt. This resistance (Buck's fascia) is just pierced by the needle, and then after aspiration (to be sure that the needle is not within a blood vessel) 4 ml of the 1 per cent Xylocaine solution is injected (fig. 1). This procedure is repeated on the opposite side. The subcutaneous tissues on the dorsal and ventral aspects of the base of the penis are then infiltrated with 3 ml of solution each. The penis is now completely anesthetized and the circumcision may be performed. If procaine is used rather than Xylocaine, it will be necessary to wait approximately from 5 to 10 minutes before the anesthetic takes effect.

Figure 1. Injection of anesthetic beneath Buck's fascia.

A crushing Kelly clamp is applied to the dorsum of the prepuce in the midline and two small hemostats are used for retraction. The clamp is removed and the prepuce is cut along the crushed line, producing an almost bloodless incision. Care must be taken not to injure the glans or urethra (fig. 2). The incision is extended along the inner surface to a point 1 cm from the corona of the glans. A suture is inserted through mucosa and skin at the apex of this incision (fig. 3). The ends of this suture are left long and are clamped for retraction during the rest of the procedure.

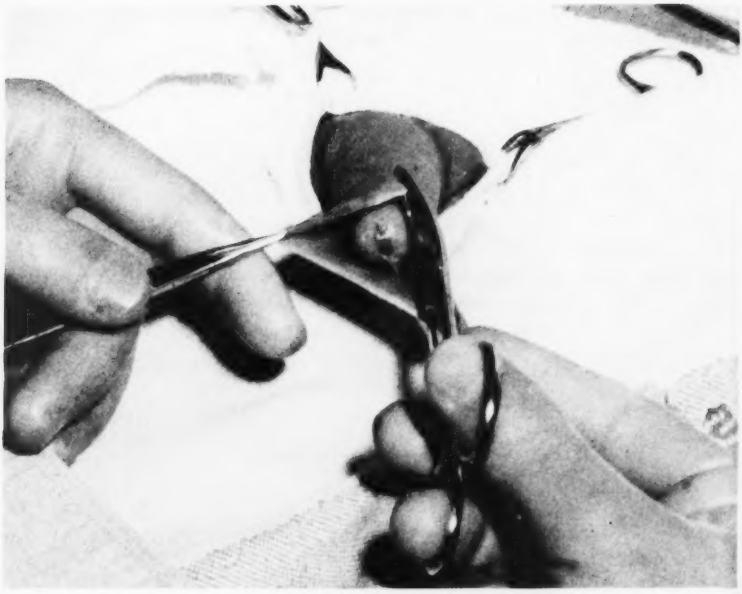

Figure 2. Incision on dorsal aspect of prepuce.

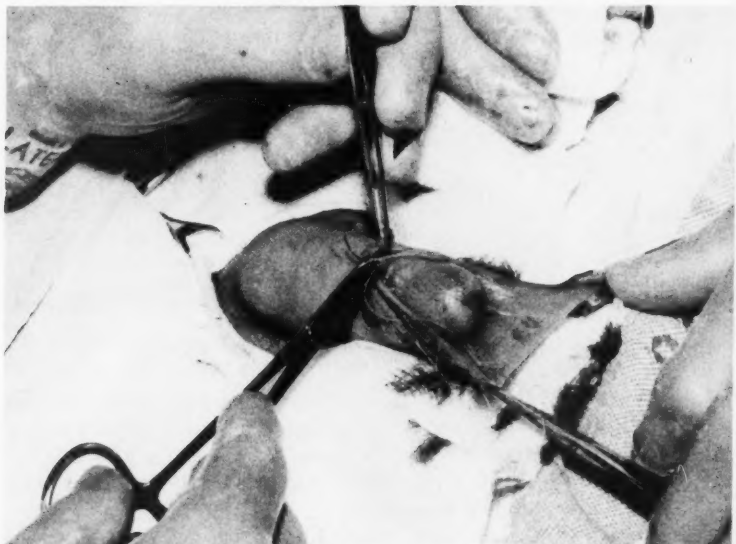

Figure 3. Placement of suture at apex of dorsal incision.

If only a dorsal slit is desired rather than a complete circumcision, the operation can be terminated at this point by the insertion of a few interrupted sutures along the skin margins. The prepuce is now rolled back completely and the exposed glans is thoroughly swabbed with the Zephiran solution. Using two small hemostats for retraction, a crushing Kelly clamp is applied to the midline of the ventral surface of the prepuce. The clamp is removed and the prepuce is cut along the crushed line, again stopping the incision at a point 1 cm from the corona of the glans. A second suture is inserted through the skin and mucosa at the apex of the ventral incision. The ends of this suture are also left long and clamped for retraction. Using the two sutures as a guide, and using hemostats to stretch the prepuce, the prepuce is cut off on one side (fig. 4), leaving a 1-cm margin around the corona. The same procedure is repeated on the other side. The glans is retracted by the assistant's finger, using a gauze sponge to prevent it from slipping.

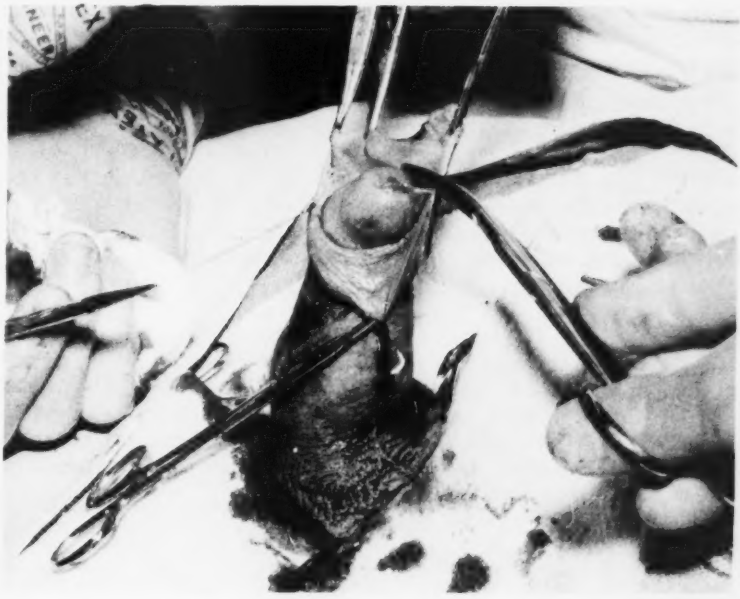

Figure 4. Excision of redundant prepuce between dorsal and ventral incisions.

Small bleeding points are controlled with hemostats and 0000 catgut ties. This step is most important to prevent postoperative hematoma formation. A suture for retraction is now inserted on each side, midway between the dorsal and ventral sutures. This divides the circumference of the incision into four equal quadrants, with a retraction suture at each corner. With the assistant

holding two adjacent retraction sutures, the skin edge and the edge of the mucosa are easily approximated with three evenly spaced interrupted sutures in each quadrant. The underlying subcutaneous layer is not included in the sutures. This ensures mobility in the area of approximation of the edges of the incision. The long ends of the retraction sutures are cut and a layer of gauze impregnated with petroleum jelly is placed over the incision. A bandage is applied fairly tightly to the end of the penis as another precaution against hematoma formation.

POSTOPERATIVE CARE

Postoperatively, the patient may be ambulatory. Codeine sulfate is given orally to control any pain the patient may have in the immediate period following the circumcision, but there is no need for it after the first day. The discomfort occasioned by infrequent erections lasts only a day or two. We have not found it satisfactory to administer estrogens for the control of erections, because these drugs may have an unpredictably long action, which may be more distressing to the patient psychologically than the few erections which cause him discomfort.

The bandage is removed on the first postoperative day and the patient is started on warm soaks four times a day. For this purpose an ordinary drinking glass half filled with warm water is satisfactory. No antibiotics are necessary. All discomfort disappears by the second postoperative day. The soaks are continued until all the sutures fall out, which may take four or five days, but the patient can be back on duty and need not be hospitalized for this.

SUMMARY

The use of spinal or general anesthesia for routine circumcision in adults is condemned as being unnecessary and hazardous. A simple, safe, and most effective technic using local anesthesia is available and is especially suitable for use by the military medical officer. Only 24 hours of hospitalization are required when this technic is used.

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The difference between lunch and luncheon is two dollars.
—Martin H. Fischer

DIAMOX IN PREECLAMPSIA

HUMBERT L. RIVA, *Lieutenant Colonel, MC, USA*
WOODROW L. PICKHARDT, *Lieutenant Colonel, MC, USA*
MERRILL M. BECKER, *Major, MC, USA*

A STUDY in the management of preeclampsia was conducted at this hospital throughout 1954 and 1955 to compare the diuretic effectiveness of Diamox (brand of acetazoleamide) to that of ammonium chloride and of bed rest alone. Two hundred and twenty-five patients having mild or moderate preeclampsia with fluid retention were admitted during this period. The diagnosis was based on the criteria set forth by the Committee on Maternal Welfare.[1] Toxemias of pregnancy other than preeclampsia were excluded from the study. The following procedures were prescribed for all patients:

Diagnostic determinations:

Blood chemistry studies to determine blood urea nitrogen, carbon dioxide combining power, albumin/globulin ratio, sedimentation rate, uric acid, and sodium chloride, on admission and repeated on the fifth day.

Complete blood count and hematocrit on admission.

Weight on admission and daily thereafter before breakfast.

Blood pressure and fetal heart tones twice daily.

Complete urinalysis, including determination of acetone and diacetic acid, every other day.

Twenty-four-hour quantitative urinalysis for albumin three times weekly.

Twenty-four-hour urinalysis for sodium daily.

Daily fluid intake and output.

Funduscopic examination.

Therapeutic regimen:

Bed rest with bathroom privileges.

Presented at the Regional Meeting of American Academy Obstetrics and Gynecology, Washington, D. C., on 7 April 1956.
From Walter Reed Army Hospital, Washington, D. C.

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Diet: 1,000 calories, 200 mg sodium, high protein.

Phenobarbital, 0.03 gram, four times a day.

One multivitamin capsule daily.

Ferrous sulfate, 0.3 gram, three times a day.

Of the 225 patients, 78 were eliminated from the study because they were delivered during the period of management. Sixty of the remaining 147 were given 250 mg of Diamox daily for five days, 42 were given 9 grams of ammonium chloride in divided doses daily for five days, and 45 were placed on bed rest alone for the same length of time.

RESULTS

The mean results of similar data from all patients are shown in table 1. The age, gravida, parity, weight at the beginning of pregnancy, weeks' gestation before edema appeared, weight on admission, and total weight gain were comparable for the three groups of patients.

TABLE 1. *Comparison of average weight changes in 147 patients with preeclampsia of pregnancy*

Data	Mean results in patients treated with		
	Diamox (60 patients)	NH_4Cl (42 patients)	Bed rest (45 patients)
Age	26.63	26.98	26.80
Gravida	2.03	2.17	1.87
Parity	0.89	0.16	0.80
Weight at beginning of pregnancy	140.8	137.9	145.0
Week edema manifest	34.5	36.1	34.4
Weight on admission	167.7	164.1	171.5
Total weight gain	26.9	26.2	26.5
Weight loss after five days of therapy*	9.6	7.8	7.2

*Average

After five days of therapy the average weight loss in those patients treated with Diamox was 9.6 pounds, as compared with an average weight loss of 7.8 pounds in those treated with ammonium chloride and of 7.2 pounds in those who were on bed rest alone.

Of the 60 patients treated with Diamox, several had paresthesias and several had blurring of vision caused by ciliary spasm.

These symptoms were transitory. There was one case of hematuria, thought to be the result of the sulfonamide-like structure of Diamox,[2-11] inasmuch as the patient was known to be sensitive to sulfonamide and had had a similar toxic manifestation.

DISCUSSION

In view of the comparability of all the figures obtained, with the exception of the weight loss of the 60 patients given Diamox therapy, it seems probable that Diamox has clinical significance as an adjunct in the treatment of preeclampsia. It is a diuretic and acid base regulator of low toxicity. Peripheral and circumoral paresthesias occur in some patients, but are mild and transitory. Drowsiness, mild acidosis, blurring of vision, and fever with rashes such as those observed with sulfonamides sometimes occur.

Diamox is a nonbacteriostatic sulfonamide derivative possessing distinctly different chemical structure[12] and pharmacologic activity than those of the bacteriostatic sulfonamides. It is an enzyme inhibitor, acting specifically on carbonic anhydrase. Its diuretic effect is due to retardation of the reversible hydration of carbon dioxide and dehydration of carbonic acid reaction in the kidney. The result is renal loss of bicarbonate ion, which carries out sodium, water, and potassium, without loss of chloride. Diuresis and alkalinization of the urine thus occur. Diamox is completely absorbed from the gastro-intestinal tract and is almost completely excreted unchanged in the urine in 24 hours.[10,11]

As adjunctive therapy in the elimination of excess fluid in the pregnant patient, a single daily dose of 250 to 500 mg is recommended. Therapy should be continued as long as control of edema is required. When oral therapy is impossible, the drug may be administered intravenously or intramuscularly in the same dosage as indicated in the oral form, but oral therapy should be prescribed as soon as practicable. Intravenous doses of from 750 mg to 1 gram have been used with impunity.

SUMMARY

The effectiveness of Diamox in producing diuresis in patients having preeclampsia with edema was compared to that of ammonium chloride and of bed rest alone. The latter proved to be effective, and ammonium chloride added to bed rest was statistically no more effective. Diamox therapy, however, was about 20 per cent more effective in promoting diuresis than either bed rest alone or bed rest plus ammonium chloride.

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PSYCHIATRIC ASPECTS OF THE MENOPAUSE

There is no single psychopathological entity in the menopausal period. The emotional illnesses of this time of life are not directly related to glandular deficiency but, rather, are the result of the individual's reaction to physiological, physical and environmental changes taking place..Significant dynamic factors are fear of the menopause itself, reaction to physical aging and loss of physical attractiveness, psychosexual conflicts, the end of the child-bearing period, the feeling of uselessness when the children are grown, and the death of loved ones. A prophylactic approach is indicated; in particular, a healthy and scientific attitude of the patient toward the menopause, and the development of personality assets and interests for the better use of leisure time.

—GEORGE J. WRIGHT, Jr., M. D.
in *West Virginia Medical Journal*
pp. 172-173, July 1954

Clinicopathologic Conference

U. S. Naval Hospital, Portsmouth, Va.*
U. S. Naval Hospital, San Diego, Calif.**

DIABETES

Case 1.

Summary of Clinical History. A 34-year-old former Marine Corps major was brought to the emergency room of a naval hospital at 0515 hours on 25 June 1952. He was semicomatose on admission and within five minutes was comatose. He had been sent to the hospital by a civilian physician who had sent a note along with him stating that he had seen the patient at 0430 hours on the same day and that he thought that the patient was in diabetic or insulin shock, and recommended an emergency blood sugar. At the time, no further history was obtainable, but subsequently it was learned that he had a history of diabetes extending over a period of three years which was controlled by 20 units of insulin daily. In addition, it was learned that sometime during the previous three years he had spent a month at a Veterans Administration hospital where he was treated for cirrhosis of the liver. Ten transfusions were given him during the period of that hospitalization because of bleeding from his gastro-intestinal tract. He was treated again at a hospital for a period of three days in March 1952. Admission complaints then were weakness, fainting, dyspnea, and ascites. He had had "influenza" for the preceding few days and had taken insulin irregularly. There had been no vomiting or diarrhea. Stools were black but he had been taking some form of iron. The diagnoses on discharge were: (1) diabetes mellitus; (2) Laennec's cirrhosis, liver; and (3) secondary anemia. There was a history of "heavy drinking" for the preceding three years. He had worked

*Rear Adm. O. B. Morrison, Jr., MC, USN, Commanding Officer. From the Pathology Service, Capt. Wilmot F. Pierce, MC, USN, Chief.
**Rear Adm. Robert M. Gillett, Commanding Officer.

as a store manager for a paint company after his discharge from the Marine Corps. The day prior to the last admission, he had complained of general malaise and at approximately 0130 hours on 25 June 1952, when he was getting out of bed to go to the bathroom, had tripped on a waste basket in his bedroom and had fallen. At 0400 hours the doctor was called because the patient seemed semicomatose. The doctor advised, by telephone, that the patient be given a glass of orange juice and that he be called if there was no response. The physician was called again at 0430 hours, and when he arrived, the patient was stuporous and mumbled something about insulin. The doctor noted an "acetone breath."

Physical Examination On admission the patient was pale, and no blood pressure reading or pulse could be obtained. The heart sounds were regular, but weak and rapid. His lungs were clear, skin was dry, and his eyeballs were soft. Ascites and pitting edema of the ankles were evident. The spleen and liver were not definitely felt. There was areflexia. There were ecchymoses over the chest.

Course in Hospital. An emergency blood sugar determination was 204 mg per 100 ml; his urine was negative for sugar, acetone, and diacetic acid. He was given 10 per cent dextrose and water and 50 units of insulin intravenously. The admission note stated that this was started just before the blood was drawn for the blood sugar determination. One ampule of caffeine and sodium benzoate and one ampule of vasoxyl (brand of methoxamine hydrochloride) were given. The latter was repeated once. The patient did not respond to any of the treatment and died at 0645 hours on 25 June 1952, before any other investigative studies could be carried out.

Case 2.

Summary of Clinical History. A retired white naval medical officer, 65 years old, was a patient in a naval hospital two times before his final admission. The first was in February 1948 because of polyuria, polydipsia, dry scaly skin, and pleuritis, all of which had been present for several months. He said that he had been completely well until a year before. However, there was a history of mesenteric thrombosis following bilateral thrombophlebitis which, in turn, had complicated varicose ulcers of both legs in 1940. No other significant past history was elicited. His father had died of carcinoma of the prostate gland. He was obese; his blood pressure 165/90 mm Hg. The liver edge was felt 4 cm below the right costal margin; there was hemosiderosis of both legs, and there was 2-plus edema of both lower extremities. His electrocardiogram was reported to be essentially normal. At that time he was found to have diabetes mellitus which was fairly easily controlled with 15 units of protamine zinc-insulin injection and 10 units of regular insulin plus a restricted diet. After a period

of 25 days he was discharged from the hospital. No liver studies were carried out at the time of that admission.

He was admitted again in February 1949 because of shortness of breath, a full feeling in his abdomen, and polyuria. He had made little if any attempt to control his diabetes during the period between these hospital admissions. His blood pressure was 180/80 mm Hg. There was ascites; the edge of the liver was palpable 3 cm below the right costal margin. Blood sugar was 296 mg per 100 ml; carbon dioxide combining power was 19.6 volumes per cent; sugar, diacetic acid, and acetone were all present in his urine. No difficulty was encountered in controlling his diabetes and he was discharged after 18 days with instructions to continue taking 25 units of regular insulin daily. During this admission, his cephalin-cholesterol flocculation was reported to be 4 plus in 24 hours; thymol turbidity was 2 units.

His last admission was on 29 July 1952, and he was comatose at that time. Members of his family stated that he had lapsed into coma the previous day. They also stated that they had noticed jaundice for the first time about two weeks before, and that the patient had had attacks of abdominal pain throughout the previous year, had eaten poorly for several months, and had used alcohol excessively.

Physical Examination. The patient was deeply jaundiced at the time of this admission. The liver was greatly enlarged, nodular, and hard, and the abdomen was distended with fluid. His blood pressure was 136/80 mm Hg.

Laboratory Studies. Hemogram and blood sugar were normal; blood urea nitrogen was 59.5 mg per 100 ml, and his urine was bile stained. An electrocardiogram showed only a prolonged Q-T interval.

Course in Hospital. An indwelling catheter was placed in the bladder, and he excreted about 500 ml of urine daily. Hydration was maintained with 2,000 ml of fluid daily consisting of 5 per cent dextrose solution, Ringer's solution, and normal saline, together with 20 units of insulin. His blood sugar remained normal. He did not gain consciousness and died at 0255 hours on 4 August 1952.

DISCUSSION

Doctor Critzer:* I am going to try to present these two patients today simultaneously, for they parelleled each other very closely. Both were very lackadaisical diabetics. Their diabetes was of relatively short duration—three years in the first case and four in the second. Both had evidence of fairly severe concomitant liver disease, and both, pre-

*Lt. Ben L. Critzer, MC, USNR, Medical Service.

sumably, were alcoholics, although in the case of the physician, the summary states only that an excessive alcoholic intake occurred in the few months prior to his final admission. It is likely that his alcoholic intake was excessive over a longer period of time.

Both patients had had two previous hospital admissions because of difficulties encountered in diabetic management and, what seems more significant, evidence primarily of liver dysfunction and its complications dominating an otherwise not so severe diabetic picture.

The major was first admitted for treatment of cirrhosis, and at that time multiple transfusions were necessary for massive gastro-intestinal bleeding, presumably from esophageal varices. A departure from diabetic management and an associated respiratory tract infection were the reasons for the second hospitalization. Ascites was found at that time.

The physician's first recorded hospitalization resulted in the initial discovery of his diabetes. Associated findings at that time were not only the usual symptoms and pathology of diabetes, but also hepatomegaly, moderate hypertension, "hemosiderosis" of both legs, and dependent edema. There was a past history of mesenteric thrombosis following thrombophlebitis of leg varicosities and ulceration some 12 years before. I am not quite sure that mesenteric thrombosis and thrombophlebitis of the leg are significant in relation to his diabetes. Perhaps they complicated an attack of pancreatitis.

His next admission, a year later, again was because of neglectful management of his diabetes, and at that time a rather severe state of diabetic acidosis developed. However, just as important at that time was the finding of persistent hepatomegaly; ascites had developed, and liver function studies indicated serious hepatic impairment.

On their terminal admissions both patients were comatose, both having become so only a short time prior to being brought to the hospital. The duration of the major's coma was a matter of only an hour or so. On the day prior to his last admission he had complained of general malaise, and a few hours before admission he fell in his room, became semicomatose, and did not respond after he was given some orange juice as advised by his doctor. When he was admitted, peripheral vascular collapse was evident, and he was dehydrated and deeply comatose. Ten per cent dextrose was started shortly before blood for sugar determination was drawn. The result of that determination was 204 mg per 100 ml. There was no clinical improvement and even though stimulants and vasopressor agents were administered, he died promptly.

This is to be considered a rather sudden and rapid demise even for a careless diabetic. That he had serious liver disease there can be no doubt, and with poor nutritional history and excessive alcoholic intake progression was to be expected. Perhaps there is no deadlier combination than diabetes and embarrassment of liver function. Since the liver figures importantly in carbohydrate metabolism and maintenance of a

constant blood sugar level, cirrhotics are extremely prone to insulin shock. Storage and release of glycogen by the liver require insulin, and in a poorly functioning or fatty liver a deficiency in this function develops since there is no place to put this important sugar. It is not hard to conceive of a rapid infusion of dextrose, even for a minute or two, raising the blood sugar to 200 mg per 100 ml, especially since it could not have had time to become evenly distributed throughout the extracellular fluid. Therefore I think it is most likely that this patient died of insulin shock. Although there was a history of a fall and possible head injury, and areflexia found on admission suggested the possibility of intracranial hemorrhage, it would be hard to distinguish between central nervous system embarrassment by massive hemorrhage and its embarrassment by deprivation of necessary nutrition. Injury to the chest at the time he fell should be considered, for this might have initiated another massive esophageal hemorrhage, but except for the profound shock there is nothing noted that would lend credence to this.

The physician, I feel, presented a different problem on his final admission. He had become jaundiced two weeks prior, and there was massive ascites and evidence of renal failure. In addition, his demise was not nearly so rapid; he remained comatose about one week before death. Insulin shock or diabetic acidosis do not seem to have been involved, for control of his diabetes was apparently maintained, at least according to repeated blood sugar determinations. I believe that the greater part of the evidence points toward cholemia or perhaps the so-called hepatorenal syndrome. The presence of cholemia is difficult to prove clinically, for it has been stated that there are no specific findings, except laboratory findings of hepatic failure, that enable one to distinguish between hepatic coma and any other form of coma. These laboratory evidences do not necessarily show any marked change when a patient passes from a state of moderate hepatic dysfunction to what is known as cholemia. Because jaundice need not be present and neurologic findings are not constant, this is largely a diagnosis of anticipation.

Several things are mentioned in the summary which make one think of a basis for concomitant diabetes and liver failure in this patient. The history of chronic dry, scaly skin and hemosiderosis of both legs are frequent findings in hemochromatosis or bronze diabetes. But usually the diabetes is much more severe and requires more insulin for control than was necessary in this patient. The "hemosiderosis" is probably explained on the basis of incompetence and stasis in the veins of the legs, though hemosiderin deposition in the skin is not necessarily a constant in hemochromatosis. Organ involvement is the paramount manifestation. The development of jaundice and discovery of a very large, nodular, hard liver might suggest hepatic malignancy, which also is not too uncommon in hemosiderosis; the incidence is from 10 to 15 per cent.

I feel that, even though a normal blood sugar was found, the first patient died of hypoglycemia in the presence of diabetes and cirrhosis.

The second patient's final episode, I believe, was cholemia and/or "hepatorenal syndrome" resulting in coma—possibly on the basis of hemochromatosis or hepatic malignancy; but I will just stick to cirrhosis.

Dr. Critzer's diagnoses:

Case 1. Hypoglycemia with presence of diabetes and cirrhosis

Case 2. 1. Cholemia and/or "hepatorenal syndrome" in the presence of cirrhosis
2. Diabetes mellitus

PATHOLOGIC FINDINGS

Doctor Pierce: Clinically, both of these men had diabetes and cirrhosis, and at autopsy both had large, cirrhotic livers. The liver of the first patient weighed 3,160 grams, and of the second, 3,850 grams. The incidence of the combination of diabetes and cirrhosis reported in the recent literature varies considerably—from less than 1 per cent to 24 per cent. Adhering to the concept that diffuse hepatic fibrosis develops as a reaction to the accumulation of some substance within the cytoplasm of the hepatic cells, which results in interference with the intralobular circulation and leads to malnutrition and degeneration of the parenchyma,[1] and that this is demonstrated in glycogen disease, adult Gaucher's disease, xanthochromatosis, Niemann-Pick disease, and occasionally in amyloid disease, we would expect the incidence to be high. One of the first experimental observations on diffuse hepatic fibrosis was that it developed in depancreatized dogs. That its development in such dogs can be prevented fairly well by adequate therapy with insulin and diet has been shown.[2] The descriptions of the livers of diabetics in the pre-insulin days frequently mentioned that they were cirrhotic or fatty. Generally good management of diabetes probably accounts for the present less-frequent occurrence of the combination. This is reflected in the reports in the literature; the highest incidence is reported from hospitals and clinics where good control of diabetics is not possible. Conversely, a damaged liver may cause disturbances of blood sugar levels, including hyperglycemia. Whether or not this type of hyperglycemia can be called diabetes mellitus depends, as pointed out by Spellberg,[3] on the definition of diabetes, but when it occurs in patients with diabetes, it may complicate this disease severely. Hypoglycemia as a result of liver damage, on the other hand, may result in apparent improvement in a diabetic. The ease of control of the disease in the two patients discussed today, especially terminally in the second, may well have been due to the concomitant cirrhosis.

In the first patient, bleeding from the gastro-intestinal tract had occurred at least once prior to the last admission to the hospital. Definite esophageal varices were not noted at autopsy, but there was a small, active ulcer on the posterior wall of the duodenum. The role of portal hypertension as a cause of peptic ulcer has been stressed by

Palmer.[4] From his gastroscopic observations in cirrhosis, he thought that both ischemia, as governed by shunting of arterial blood away from the mucosa, and plethora, incident to portal hypertension, may lead to mucosal hypoxia and the development of erosions. There is no doubt that esophageal varices are the most usual source of bleeding in gastrointestinal tract hemorrhage occurring in cirrhosis of the liver, but peptic ulcers, especially superficial ulcerations, occur in numbers significant enough to indicate that there is a causal relationship, and that the assumption that bleeding in patients with alcoholism is from esophageal varices is dangerous.

The influence of diabetes as a cause of peptic ulcer is less clear. In most clinics, the reported incidence is very low. Palmer, in discussing drugs and gastric mucosal injury, included insulin among the drugs that produce such injury, and he cited work done by Hanke,[5] who found that high parenteral doses of insulin caused distinct macroscopic and microscopic mucosal alterations in eight of 10 cats. Acute erosions occurred throughout the stomach, especially in the distal portion. The distal esophagus and proximal duodenum were also involved. One reason, of course, for a low incidence of peptic ulcers in diabetics is the fairly frequent finding of achlorhydria, as was found in 32.8 per cent of 399 diabetics studied by Joslin and associates.[6] This number, at least, can be considered as not being candidates for peptic ulcer. In a study of hypoglycemia in relation to duodenal ulcer, Beck[7] studied 96 patients to ascertain if there might be a greater incidence of hypoglycemia among patients with roentgenographically proven duodenal ulcer, and therefore with an increase of free hydrochloric acid, than in a control group. There were 47 in the group with duodenal ulcer who had free hydrochloric acid; of this number 51 per cent had hypoglycemia (70 mg per 100 ml or less). Forty-nine patients had no ulcer but had symptoms mimicking ulcer. Forty of these had free hydrochloric acid, nine had achlorhydria; five (12.5 per cent) with free hydrochloric acid had hypoglycemia. None of those with achlorhydria had hypoglycemia. If the hypoglycemia in persons with peptic ulcer is related to disturbed insulin secretion, namely, hyperinsulinism, we might infer that overzealous therapy with insulin or, again, poor regulation of insulin dosage might be important factors in the cause of ulceration of the stomach in diabetes, and especially if cirrhosis of the liver and portal hypertension are also present.

Disturbed gallbladder function was present in both of these men. In the first, there was atresia of the cystic duct with atrophy of the gallbladder, and in the second there was cholecystitis and cholelithiasis. There is a high incidence of diabetes in biliary tract disease due to infection calculosis or functional obstruction.[8] Either may result in diabetes mellitus, pancreatitis, or in both, or at least in pancreatitis followed by diabetes. The cholecystitis and cholelithiasis probably accounted for the frequent attacks of abdominal pain in the second patient.

The immediate cause of death in the first patient was hemorrhage. However, the bleeding was not from any portion of the gastro-intestinal tract. The ulcer, which has been mentioned, showed no sign of recent bleeding. When this man stumbled and fell, the 10th, 11th, and 12th ribs on the left side were fractured, and the fractured ends lacerated the spleen. That hypoglycemia might have accounted for his stumbling as he attempted to make his way to the bathroom cannot be denied, for as Doctor Critzer has stated, the finding of a normal blood sugar after the patient had arrived at the hospital and dextrose had been started intravenously is no assurance that he did not have hypoglycemia.

In the second patient, as in the first, the complication of alcoholism was undoubtedly a potent factor in the inadequate management of his diabetes. There were no gross ulcerations of his esophagus or stomach, but there were large esophageal varices and multiple petechiae of the gastric mucosa and of the mucosa of the small bowel. In addition to his cholecystitis and cholelithiasis, there was a chronic pancreatitis. In the major's pancreas, there was an apparent decrease in the actual number of islets, and in the islets seen there were varying degrees of degenerative change—hyaline degeneration or active fibrosis.

The gross diagnosis of cirrhosis was confirmed microscopically in the livers of both men. In addition to the scarring, there was some degree of fatty metamorphosis in both (fig. 1). The complicating biliary

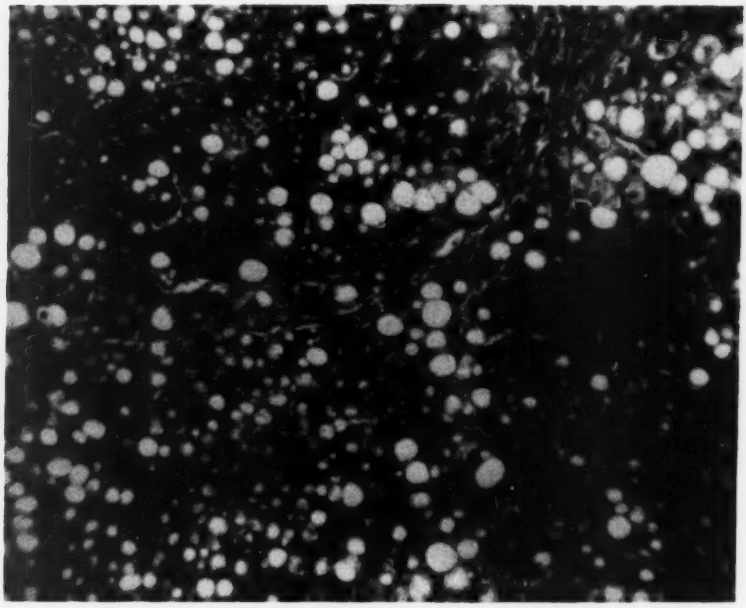

Figure 1 (case 2). Section of liver showing fibrosis extending into pseudolobules and fatty metamorphosis.

tract disease in the doctor's liver is evidenced by bile stasis in the canaliculi and by the very marked bile duct hyperplasia (fig. 2). Both

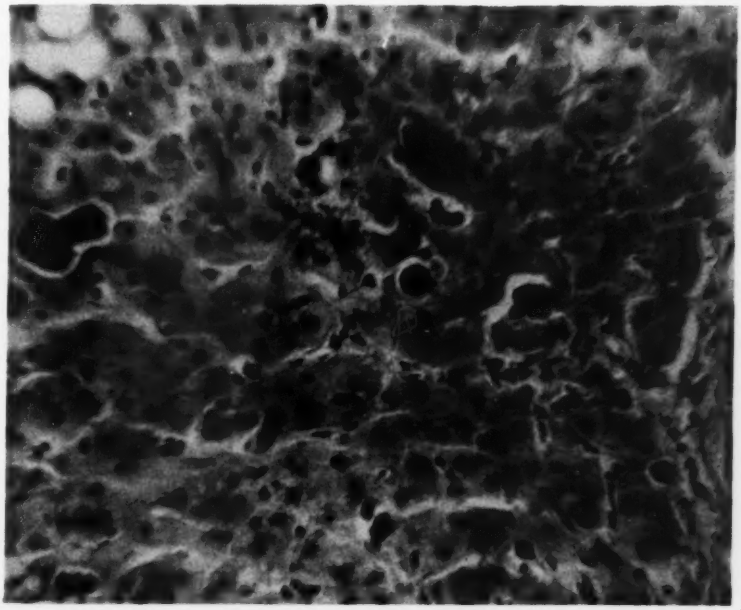

Figure 2 (case 2). Section of liver showing bile plugging of canaliculi.

of these occur in portal cirrhosis, but usually not to this degree. The over-all pattern of changes in this liver are those of portal cirrhosis (fig. 3), and the changes are interpreted as portal cirrhosis with complicating biliary tract disease. The latter occurred late, it would appear, after the portal cirrhosis was well established. Both men had some degree of arteriosclerotic heart disease. The kidneys of both men showed a mild to moderate degree of change due to arteriosclerosis, and in the second patient there also was bile nephrosis. The doctor had grade II to III arteriosclerosis of the cerebral arteries, and an incidental finding of interest was a latent carcinoma in his prostate gland.

Pathologic diagnoses:

Case 1.

1. Traumatic laceration of spleen with exsanguination into peritoneal cavity
2. Fracture, simple, complete, left ribs 10, 11, and 12
3. Cirrhosis, liver (diffuse hepatic fibrosis)
4. Diabetes mellitus, clinical
5. Degenerative changes and/or fibrosis, pancreatic islets
6. Peptic ulcer, duodenum

Case 2.

1. Cirrhosis, liver (diffuse hepatic fibrosis) with generalized icterus
2. Diabetes mellitus, clinical
3. Cholecystitis and cholelithiasis and intrahepatic biliary tract disease
4. Pancreatitis, chronic and minimal, acute
5. Arterial and arteriolar nephrosclerosis and bile nephrosis

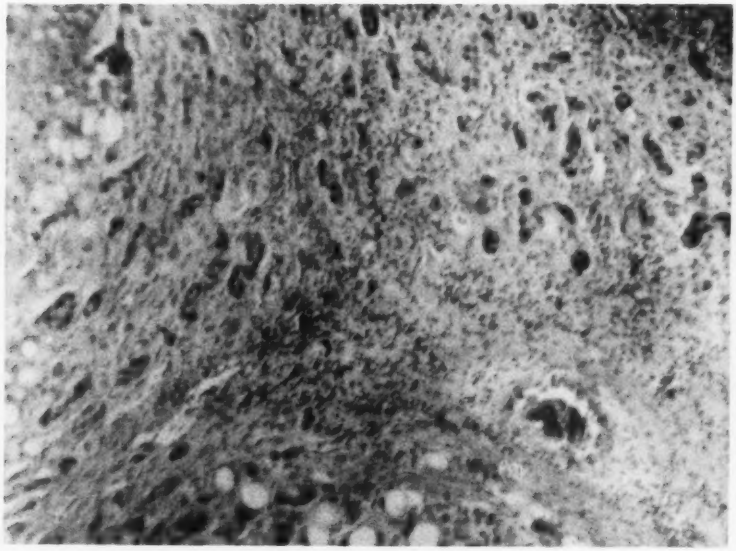

Figure 3 (case 2). Section of liver showing dense portal fibrosis and bile duct hyperplasia.

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LIMITING DEFECTS OF ARMY INDUCTEES IN PHYSICAL CATEGORIES B AND C

BERNARD D. KARPINOS, *Ph. D.*
GRACE SOUTHER

IT HAS been an established procedure in the Army since 1944 to profile each individual at the time of his physical examination for military service. The primary objective of the profiling has been to evaluate, on the basis of the physical examination findings, the individual's physical capacity from a functional rather than from a diagnostic point of view. This is particularly important with respect to individuals found qualified for military service.

Initially, the profile system was established for the purpose of providing an adequate qualitative distribution of the available qualified manpower between the various armed services—a distribution which was very much unbalanced during World War II and which had placed the Army, particularly the Army Ground Forces, in a very unfavorable position.[1] In addition, however, the profiling system aimed at a second, not less important, function; namely, assessing the individual's ability to perform particular military duties.[1,2]

The profiling has been accomplished by appraising the individual's functional capacity in terms of the well-known PULHES factors, which symbolize the following:

P—Physical capacity or stamina: Organic defects, age, build, strength, stamina, height, weight, agility, energy, muscular co-ordination, and similar factors.

U—Upper extremities: Functional use, strength, range of motion, and general efficiency of hands, arms, shoulder girdle, and spine (cervical, thoracic, and lumbar).

L—Lower extremities: Functional use, strength, range of motion, and general efficiency of feet, legs, pelvic girdle, and lower back (sacral spine).

H—Hearing (including ear defects): Auditory acuity as well as organic defects.

From the Office of the Surgeon General, Department of the Army, Washington, D. C.

E—Eyes: Visual acuity as well as organic ocular defects.

S—Psychiatric: Emotional stability and personality as well as psychiatric history and findings.[3]

Except for the P factor, each profile factor obviously relates either to the functional capacity of a specific organ or organs, or to a specific evaluation, as the S factor. The P factor, however, is both specific and general. It is specific in that it refers to the functional capacity of all parts or organs of the body not specified under the other factors; it is general in that it is affected by the extent to which defects of any organ, including disorders of a psychiatric nature, are affecting a person's general functional ability.

In evaluating a person's profile, each of the profile factors is graded on a numerical regressive scale from 1 to 4, according to the man's functional capacity in the particular factor. Generally, grade 1 represents functional efficiency above the average, with no physical defects or minimal physical defects; grade 2 represents average functional efficiency, with mild, nonprogressive physical defects; grade 3 represents functional efficiency below the average, with moderate physical defects (borderline); and grade 4 represents functional capacity below the existing minimum requirements for military service.[3] The term "limiting defect" is used for indicating defects graded 2 or 3, as distinct from defects of a disqualifying nature (grade 4).

On the basis of this grading under the PULHES system an individual is assigned to one of the following four physical categories: A, B, C, or E. The first three categories refer to individuals qualified for military service; the fourth category is the disqualified group. The assignment of a physical category is done as follows: A—no factor in the profile system is graded lower than 1; B—at least one factor is graded 2, but no factor is graded lower than 2; C—at least one factor is graded 3, but no factor is graded lower than 3; E—at least one factor is graded 4. It is with the qualifying categories, specifically the physical categories B and C, that this article is concerned.

DISTRIBUTION BY PHYSICAL CATEGORY

An evaluation of inductees in physical categories B and C in terms of PULHES factors had previously been published.[1] However, only general reference was then made to the specific diagnoses involved in establishing the particular physical category. The present data, being based on a larger number of records than the published study, made it possible to present a more detailed diagnostic breakdown of the limiting defects. Prior to presenting these data, however, a general distribution, by physical category, of inductees and enlistees and of the two groups combined is shown in table 1, mainly for general orientation. The data cover the period from 1953 through 1954.

TABLE 1. *Distribution of U. S. Army inductees and enlistees by physical categories A, B, and C and by race (1953-1954)**

Physical categories	Per cent distribution by race		
	Total	Caucasian	Other
Inductees	100.0	100.0	100.0
A	73.9	72.7	82.6
B	15.7	16.2	11.8
C	10.4	11.1	5.6
Enlistees	100.0	100.0	100.0
A	81.1	80.3	86.1
B	12.1	12.5	10.0
C	6.8	7.2	3.9
Total	100.0	100.0	100.0
A	75.3	74.2	83.4
B	15.0	15.5	11.4
C	9.7	10.3	5.2

*Source: Office of the Adjutant General, Department of the Army: *"Qualitative Distribution of Military Accessions and Rejections."* (RCS: DD-M&P-4).

As may be noted from table 1, total accessions (inductees plus enlistees) are distributed among physical categories A, B, and C in the ratio of 75:15:10, respectively. The enlistees show a more favorable distribution by physical category than the inductees; *i. e.*, the ratio for enlistees is 81:12:7, and that for inductees is 74:16:10. By race, the non-Caucasian group ("other") showed a more favorable distribution by physical category than did the Caucasian group. This racial differential holds true for both inductees and enlistees.

DIAGNOSTIC DISTRIBUTION

The diagnostic data of physical categories B and C presented in table 2 relate to individuals who were inducted into the Army during the period from 1953 through 1954. The data were abstracted from sample tabulations of the physical examination reports (Standard Form 88) submitted to The Surgeon General's Office, Army, on individuals inducted into the Army. As may be seen from the bottom line of the table, the samples included about 97,000 forms: about 58,000 in physical category B and about 39,000 in physical category C. The data are shown separately by race.

The distribution by diagnosis was made on the basis of the primary limiting defect, which could have been either the *only* limiting defect, or the *principal* one whenever more than one limiting defect was present. (As brought out in the above-mentioned published study,[1] 14 per cent of the inductees in category B and about 7 per cent of those in category C had more than one limiting defect.) The individual diagnoses, as given in table 2, were selected on the basis of their frequency.

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TABLE 2. *Per cent distribution of U. S. Army inductees in physical categories B and C, by limiting defects and race (1953-1954)**

Defects	Physical category B			Physical category C		
	Total (%)	White (%)	Negro (%)	Total (%)	White (%)	Negro (%)
All defects	100.0	100.0	100.0	100.0	100.0	100.0
Psychiatric disorders	9.6	9.7	7.6	9.5	9.5	9.2
Psychoneurotic disorders	7.2	7.3	5.2	6.4	6.5	4.0
Character and behavior disorders	2.4	2.4	2.4	3.1	3.0	5.2
Neurologic disorders	0.3	0.3	0.2	0.5	0.5	0.3
Infective and parasitic diseases	0.4	0.4	0.2	0.7	0.7	0.9
Late effects of acute poliomyelitis	0.2	0.2	0.1	0.3	0.3	0.2
Other	0.2	0.2	0.1	0.4	0.4	0.7
Neoplastic diseases, benign	0.5	0.5	0.0	0.4	0.4	0.1
Pilonidal sinus or cyst	0.3	0.2	0.0	0.2	0.2	-
Other benign neoplasms	0.2	0.3	0.0	0.2	0.2	0.1
Allergic disorders	1.9	2.0	0.6	1.6	1.6	0.5
Hay fever	1.5	1.6	0.3	0.9	0.9	0.2
Asthma	0.3	0.3	0.3	0.6	0.6	0.3
Other	0.1	0.1	-	0.1	0.1	-
Endocrine system disorders and avitaminoses	0.3	0.3	0.1	0.3	0.3	0.2
Blood and blood-forming organ diseases	0.0	0.0	-	0.0	0.0	-

*Source: Sample tabulations of Standard Form 88 ("Report of Medical Examination").
0.0 = less than 0.05 per cent.
(-) = no cases reported.
The classifications "white" (*i. e.*, non-Negro) and "Negro" of this table and "Caucasian" and "Other" in table 1 may be considered equivalent in this case.

TABLE 2. *Per cent distribution of U. S. Army inductees in physical categories B and C, by limiting defects and race (1953-1954)*
—Continued

Defects	Physical category B			Physical category C		
	Total (%)	White (%)	Negro (%)	Total (%)	White (%)	Negro (%)
Eye defects	35.8	37.3	19.8	44.2	45.0	33.6
Refractive errors	12.7	13.3	6.2	13.6	14.1	6.6
Strabismus	0.5	0.5	0.4	2.5	2.5	2.3
Blindness, unilateral	0.3	0.3	0.2	6.0	5.9	7.1
Defective vision	21.6	22.5	12.2	18.5	19.1	11.2
Other	0.7	0.7	0.8	3.6	3.4	6.4
Ear defects	1.9	2.0	0.8	3.3	3.3	2.1
Deafness, unilateral	0.2	0.2	0.2	1.2	1.2	0.8
Defective hearing	1.0	1.0	0.4	1.4	1.4	1.2
Other	0.7	0.8	0.2	0.7	0.7	0.1
Circulatory system diseases	2.0	2.0	1.6	1.2	1.2	1.2
Varicose veins	0.3	0.3	0.4	0.4	0.5	0.7
Hemorrhoids	0.5	0.5	0.3	0.2	0.1	0.0
Varicocele	0.7	0.7	0.4	0.2	0.2	0.1
Other	0.5	0.5	0.5	0.4	0.4	0.4
Respiratory system diseases	1.7	1.8	0.7	0.8	0.9	0.2
Sinusitis, chronic	0.3	0.3	0.2	0.1	0.1	-
Nasal septum deflection	0.9	1.0	0.1	0.4	0.5	-
Other	0.5	0.5	0.4	0.3	0.3	0.2
Digestive system diseases	3.5	3.3	6.1	5.2	4.9	10.1
Teeth and supporting structures	2.5	2.4	4.2	0.8	0.8	1.9
Hernia of abdominal cavity	0.6	0.6	0.6	3.9	3.7	6.8
Other	0.4	0.3	1.3	0.5	0.4	1.4

TABLE 2. *Per cent distribution of U. S. Army inductees in physical categories B and C, by limiting defects and race (1953-1954)*
—Continued

Defects	Physical category B			Physical category C		
	Total (%)	White (%)	Negro (%)	Total (%)	White (%)	Negro (%)
Genito-urinary system diseases	0.5	0.5	0.8	0.3	0.3	0.3
Hydrocele	0.1	0.1	0.2	0.1	0.1	0.0
Other	0.4	0.4	0.6	0.2	0.2	0.3
Skin and cellular tissue diseases	1.2	1.2	0.9	1.2	1.2	0.7
Acne vulgaris	0.4	0.5	0.1	0.4	0.4	0.0
Other	0.8	0.7	0.8	0.8	0.8	0.7
Bones and organs of movement, diseases and defects	31.6	29.9	52.1	20.4	20.0	28.4
Osteochondrosis	0.3	0.4	0.1	0.4	0.4	0.1
Internal knee derangement	0.6	0.6	0.3	1.1	1.1	0.9
Sacro-iliac joint affection	0.2	0.2	0.0	0.3	0.3	0.1
Diseases of the joint	1.1	1.1	0.5	1.4	1.4	0.9
Curvature of spine	1.2	1.2	1.1	1.0	1.0	1.3
Flatfoot	20.2	18.4	42.9	7.2	6.8	13.9
Clubfoot	0.8	0.9	0.2	0.7	0.7	0.9
Hammer toe	0.2	0.2	0.4	0.1	0.1	0.2
Shortening of lower extremity	0.2	0.2	0.1	0.4	0.4	0.5
Amputation of fingers	1.0	0.9	1.3	0.9	0.9	1.4
Limitation of motion	1.9	1.9	1.9	2.4	2.4	3.4
Deformities or impairments	2.5	2.5	2.0	2.4	2.5	2.1
Other	1.4	1.4	1.3	2.1	2.0	2.7

TABLE 2. *Per cent distribution of U. S. Army inductees in physical categories B and C, by limiting defects and race (1953-1954)*
—Continued

Defects	Physical category B			Physical category C		
	Total (%)	White (%)	Negro (%)	Total (%)	White (%)	Negro (%)
Congenital malformations	0.7	0.7	0.9	2.1	2.0	2.4
Undescended testicles	0.2	0.2	0.5	1.0	1.0	1.1
Other	0.5	0.5	0.4	1.1	1.0	1.3
Miscellaneous diseases and defects	8.1	8.1	7.6	8.3	8.2	9.8
Underweight	2.5	2.4	3.3	3.6	3.5	5.2
Overweight	2.3	2.4	2.1	2.0	2.0	2.4
Other	3.3	3.3	2.2	2.7	2.7	2.2
Population bases	57,809	53,334	4,475	38,903	36,869	2,034

It may be noted from the latter table that eye defects, diseases and defects of bones and organs of movement, and psychiatric disorders were the predominant limiting defects. Inductees with such defects comprised about 75 per cent of all inductees in both categories B and C. Refractive errors and defective vision were the most prevalent diagnoses among the eye defects, while the disease defects of the bones and organs of movement consisted mainly of "flatfoot." The psychiatric disorders were primarily psychoneuroses. In view of the large frequencies of these defects, the standards governing the profiling of these particular defects are given below:

Vision

Grade 2: Meets acceptable standards and his visual acuity will not be less than 20/200 in each eye correctible to 20/40 in each eye, provided the defective vision is not due to active or progressive organic diseases.

Grade 3: Meets acceptable standards with a minimum vision of 20/400 in each eye, correctible to 20/40 in one eye and 20/70 in the second eye, or 20/30 in one eye and 20/100 in the second eye. This classification also includes those individuals with any degree of defective vision in one eye from below 20/400 to no light perception if such defective vision is not due to active or progressive organic disease and if vision in the other eye is not less than 20/100 correctible to 20/20 with glasses.

Flatfoot

Flatfoot, as in the case of other defects of the lower extremities, is to be graded 2 if it does not prevent moderate marching, climbing, et cetera, or prolonged effort. It is to be graded 3 if it causes moderate interference with functions but allows sustained effort for short periods.

Psychiatric Disorders

Grade 2: Mild transient psychoneurotic reaction. Mild character and behavior disorders. Borderline mental deficiency.

Grade 3: Mild chronic psychoneuroses. Moderate transient psychoneurotic reaction. Mental deficiency, mild degree. History of transient psychotic reaction.

Eye defects were most prevalent among white inductees; flatfoot was most prevalent among Negro inductees.

GENERAL PHYSICAL EVALUATION

For the general evaluation of the physical fitness of the inductees it seems important to relate the inductees with the most prevalent limiting defects to all inductees (categories A, B, and C), as done in table 3. This table indicates, for instance, that of

TABLE 3. *Number of inductees per 1,000, by race, with selected limiting defects (grades 2 and 3) (1953-1954)*

Most prevalent limiting defects	Number per 1,000 inductees								
	Grade 2			Grade 3			Grades 2 and 3		
	Total group	White only	Negro only	Total group	White only	Negro only	Total group	White only	Negro only
Eye defects	56	60	23	46	50	19	102	110	42
Diseases and defects of bones and organs of movement	50	48	61	21	22	16	71	70	77
Psychiatric disorders	15	16	9	10	11	5	25	27	14

each 1,000 white inductees, 110 individuals (or 11 per cent) had eye defects (60 had an eye defect graded 2 and 50 had an eye defect graded 3), and that of each 1,000 Negro inductees, 77 individuals (or about 8 per cent) were graded 2 or 3 because of defects of bones and organs of movement, primarily flatfoot. It is worth noting that, although the latter defects were predominant among Negroes, in the total evaluation the proportion of Negro inductees with such defects was not much higher than that of white inductees; that is, 8 per cent among Negro inductees as compared with 7 per cent among white inductees. This is due to the fact that there are relatively fewer Negro than white inductees in categories B and C (table 1).

There were comparatively fewer Negro inductees with eye defects, both on a proportionate basis (table 2), and on an absolute basis (table 3).

The data indicate that about 2.5 per cent of the inductees were diagnosed as having some psychiatric disorder, nondisqualifying under the present psychiatric standards. It should be noted that the psychiatric requirements were lowered after World War II.[4]

There are no comparable diagnostic data, as presented in table 2, for enlistees profiled as physical category B or C. It seems, however, that it would not be unreasonable to assume that their diagnostic distribution is likely to be basically the same as those of inductees, though the enlistees differ from the inductees in their proportional distribution by physical category, as indicated above (table 1). Presumably, the diagnostic distributions given in table 2 may be taken as essentially representative of categories B and C of all accessions—enlistees and inductees.

SUMMARY

Based on the PULHES profiling system established by the Army in 1944, all individuals entering the military service are classified in terms of physical categories A, B, and C. This classification is an evaluation of the individual's physical capacity from a functional rather than a diagnostic point of view. Physical category A represents over-all physical capacity above the average, with no physical or minimal physical defects; category B represents over-all average capacity, involving some mild (nonprogressive) physical defects; category C indicates physical capacity below the average, with moderate (borderline) physical defects. These nondisqualifying defects of categories B and C are referred to as "limiting defects."

Separate distributions by physical categories A, B, and C, covering the 1953-1954 period for inductees and voluntary enlistees, indicate that the enlistees have a more favorable per cent distribution than the inductees; *i. e.*, 81:12:7 for enlistees vs. 74:16:10 for inductees in categories A, B, and C, respectively.

A diagnostic distribution of the limiting defects of the inductees in physical categories B and C, obtained for the 1953-1954 period, indicates that these were predominantly eye defects, with refractive errors and defective vision being the most prevalent diagnoses; diseases of the bones and organs of movement, consisting mainly of flatfoot; and psychiatric disorders, primarily psychoneurosis.

Racial differentials were found in both the distribution by physical category and the diagnostic breakdown of the limiting defects.

No comparable diagnostic distribution was available for enlistees. It may be assumed, however, that their limiting defects would in all probability be distributed by diagnosis in essentially the same manner as those of the inductees.

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DIABETES AND ISCHAEMIC HEART DISEASE

"At present more than two-thirds of the deaths among diabetics are caused by atherosclerosis, and in 70% of cases ischaemic heart disease is responsible. Moreover, two out of every five diabetics have clinical or electrocardiographic evidence of coronary ischaemia, and a quarter of these are under 40 years of age. The incidence of severe coronary sclerosis among diabetics coming to necropsy is approximately three times the figure for the general population. The frequency of angina is at first sight surprisingly low, until it is realized that more than half the diabetics who develop angina are dead within a year. Finally, the chances of survival after a myocardial infarct are two to three times worse than in a control group. No less than 60% of diabetics die within sixty days of the acute episode, only 16% are alive at the end of five years, and scarcely one survives longer than ten years."

—*British Medical Journal*
p. 36, July 7, 1956

HELICOPTER MOBILE MEDICAL COMPANIES

In the Fleet Marine Force

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THE Fleet Marine Force (FMF) Medical Service was designed some two decades ago to provide medical support for the amphibious assault, an untested combat concept pioneered by the United States Marine Corps. It received its baptism in the victorious assaults of World War II.

With the detonation of atomic bombs over Hiroshima and Nagasaki and subsequent developments in the family of atomic weapons, the amphibious technic has been the subject of searching re-examination. In the last decade, triphibious assault or vertical envelopment, as a countertactic, has become pre-eminent. It is based on the capability of the transport helicopter to provide tactical mobility, surprise, and dispersion.[1]

To perform the medical mission in triphibious assault, the First Medical Battalion of the First Marine Division instituted experiments in 1955 to revise thinking and planning for future medical support. This revision was necessary after envisioning combat teams with helicopter mobility which would operate over widely dispersed areas and be subject at all times to dissolution into mass casualties. As a facet of this examination, it was decided to test the practicability of mobilization by helicopter of entire medical collecting and clearing companies.

THE FMF COLLECTING AND CLEARING COMPANY

The medical battalion of a Marine division consists of a headquarters and service company, two 100-bed hospital companies, and three collecting and clearing companies. The latter are unique to the FMF Medical Service. They are responsible not only for collecting and sorting casualties from battalion aid stations in the regimental zone of action, but also for performing emergency lifesaving surgery in their 60-bed hospitals.

The table of organization of a collecting and clearing company is shown in figure 1. For conventional amphibious operations,

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it is staffed by 4 Navy medical officers, 70 hospital corpsmen, and 22 marines. Its basic medical equipment weighs 12,763 pounds, in addition to the 10-day initial resupply block weighing over 3 tons. It is provided with 1 surgical trailer, 3 utility vehicles, 5 field ambulances, and 3 jeep ambulances.

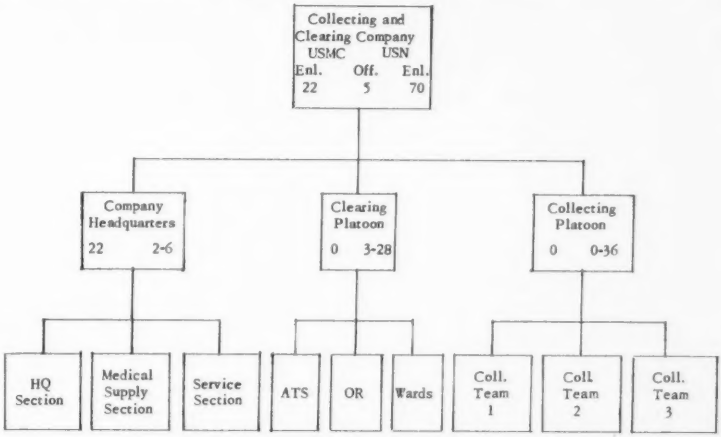

Figure 1. Table of organization of Fleet Marine Force collecting and clearing company.

In the fluid situation of highly mobile triphibious warfare, medical elements operating in support of ground combat teams must possess flexibility of organization, the capacity to incorporate needed additional support elements (shock teams; surgical teams; atomic, biologic, chemical warfare defense and decontamination teams; and preventive medicine teams) and the ability to extrude elements capable of semidetached functioning which may be vitally needed elsewhere. The FMF medical collecting and clearing company is such a unit. Medical elements must also possess the ability to respond smoothly and rapidly with attendant medical equipment to swiftly changing tactical situations. In combat involving the use of atomic weapons by both sides, the ability to airlift on an hour's notice to an area possibly denying entrance by surface vehicle but requiring its services is of the highest import.

THE TRANSPORT HELICOPTER AND DEPLOYMENT OF MEDICAL COMPANIES

At the time of the Korean campaign, when the concept of vertical envelopment was in its inception, the helicopter demonstrated its value in uses ranging from artillery observations to switching entire battalions on the front line, giving evidence from the first

that it represented a major advance in combat. The medical services of both field forces promptly utilized this work horse for evacuation of casualties from the front lines.

Experiments in heli-lifting medical collecting and clearing companies were performed with the admittedly inadequate Sikorsky transport helicopters (HRS) 1 and 3. The limitations imposed on a medical company evolved around the lift capability of this interim transport helicopter, which was from 700 to 1,000 pounds over and above its two-man crew and fuel. Factors such as the temperature of the air, the height above sea level, the level of fuel remaining, the length of flight time, and the condition of the helicopter all entered into any computation of the payload.

Only equipment falling within the lift capability of the HRS as to weight, size, and density could be considered, eliminating all vehicles, 9-kv generators, and shower units. Of the equipment thus eliminated, only the 9-kv generator was critically needed for functioning of the clearing platoon. Substitution of the presently used generators by smaller ones weighing about 250 pounds and capable of providing current for operating-room illumination, suction, and refrigeration would have made it possible to heli-lift the necessary equipment.

Flexible lift priorities for men and equipment were established so that admission, triage, and shock-team equipment and personnel could be functional while other elements were being shuttled in. Equipment loads were prepalletized and arranged so that helicopters could load either internally (fig. 2) or for external lift (fig. 3).

In the first pilot exercise, the assigned medical company minus its 10-day supply block and its vehicles was airlifted by 6 HRS-1 type helicopters provided by Marine Helicopter Transport Squadron 363 (HMR-363), El Toro, Calif., to a site 6 air miles away within 1 hour and 31 minutes from initiation of flight to termination. Forty-five helicopter lifts were required for this particular exercise. Within one hour after the lifting of first priority equipment and personnel, the admission, triage, and shock team was functional. The operating-room team was functional within 2½ hours after the lift commenced; ward teams, within 3 hours; and galley equipment for feeding patients, within 3½ hours.

In a similar exercise in a tactical desert situation at Marine Corps Training Center, 29 Palms, Calif., an entire medical collecting and clearing company complete to its 10-day resupply block but minus its vehicles, was heli-lifted 10 air miles by 6 helicopters of the HRS-3 type (HMR-362) and was functional within 3 hours.

Figure 2. Hospital corpsmen loading field autoclave aboard HRS helicopter.

Figure 3. HRS-3 (H-19) hovering prior to the external lifting of medical equipment of a collecting and clearing company being heli-lifted forward.

The medical company, resupplied by helicopter, is potentially capable of receiving casualties from surface vehicles in the area or brought in by reconnaissance helicopters, and of evacuating via transport helicopters the casualties within its zone of action who require further treatment.

Concomitant with the development of larger helicopters, studies are underway aimed at lightening medical equipment and decreasing the time required for establishing medical functions. The recent report of Storer and Krebs[2] on the development of radiothulium portable x-ray equipment for use in field hospitals is an example of this effort. The adaptation of the lightweight "Mity-Mite" and "Mule" as ambulances will further increase the potentiality for total heli-lift of medical units (figs. 4 and 5).

Figure 4. Marine HRS helicopter lifting "Mity-Mite." This lightweight vehicle can be converted into an ambulance.

Figure 5. Hospital corpsmen evacuating casualty from front line to battalion aid station in the "Mule," lightweight vehicle.

Figure 6. A 42-foot diameter geodesic dome being transported by two HRS type helicopters. This shelter can, with modifications, serve as triage or operative area.

Evaluation has been made within this battalion of adapting preassembled geodesic domes, which can be lifted by two HRS type helicopters (fig. 6), to use as triage, ward, and surgical areas in place of field tents. Continuing experiment along these lines, to adapt medical organizations to developing helicopter mobility, may result in potentially useful technics.

SUMMARY

A Fleet Marine Force medical collecting and clearing company has been expeditiously moved by the presently used helicopter (HRS). The helicopter is visualized not only as a rapid means of casualty evacuation, but also under certain tactical situations as an essential agent for increasing the mobility of medical units.

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THE PROBLEM OF NUCLEAR INDUSTRY

"Radioactive wastes from reactors must be segregated or diluted to tolerable concentrations. At present, underground storage and ocean burial are among the methods used or proposed for segregation. Both the economy and the adequacy of these methods are under continuing investigation in anticipation of the probable increase in volume of radioactive wastes.

"It is estimated that nuclear power plants completed during 1964 alone will have a power level exceeding 2.25×10^6 kilowatts, producing wastes each year of 3.3×10^{10} gallons containing 10 millicuries per gallon. An indication of the magnitude of this activity is that the entire flow of the Mississippi River would not be sufficient to dilute to permissible concentrations the fission products from these plants. Such a method of dilution, of course, is obviously least likely to be used.

—*Public Health Reports*
p. 611, June 1956

Traumatic Duodenal Transection

Complete Transverse Division Caused by Nonpenetrating Trauma to the Anterior Abdominal Wall

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ALTHOUGH traumatic rupture of the duodenum, either intraperitoneal or retroperitoneal, is a moderately rare but well-known entity, search of the literature reveals no previously reported case of complete transverse division of the duodenum caused by a nonpenetrating injury to the anterior abdominal wall. In addition, the case presented is believed to be that of the youngest patient reported to have been treated successfully for traumatic rupture of the duodenum.

CASE REPORT

A 20-month-old white boy was admitted to this hospital 18 hours after having fallen out of bed. Before being put to bed, he had eaten a normal meal and played in his usual manner. Apparently he fell out of bed while asleep. His father entered his bedroom immediately after hearing the fall from an adjoining room. The child had picked himself up from the floor and was found lying transversely across the bed. He became fretful, but after a brief period of reassurance by the parent, he fell asleep and had an uneventful night. He awakened at his usual time in the morning but was irritable, refused food, and remained lying on his bed. During the six hours preceding admission to the hospital he four times vomited dark brown material but no blood. About four hours prior to admission the patient was given an enema without result. One hour before admission he seemed lethargic and was breathing deeply.

On admission, the patient appeared moribund, with blood pressure unobtainable. The pulse was thready, was over 200 beats per minute, and at times could not be palpated. On two occasions while being examined, he had convulsions that were clonic in type. The abdomen was markedly distended and resonant. No peristalsis was audible, no organs were palpable, and no fluid wave was elicited. The presence of tenderness could not be ascertained because of the moribund

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condition of the patient, but generalized spasm and moderate rigidity were present. Roentgenograms of the abdomen with the patient in horizontal and vertical positions showed an unusually large quantity of subdiaphragmatic air (fig. 1).

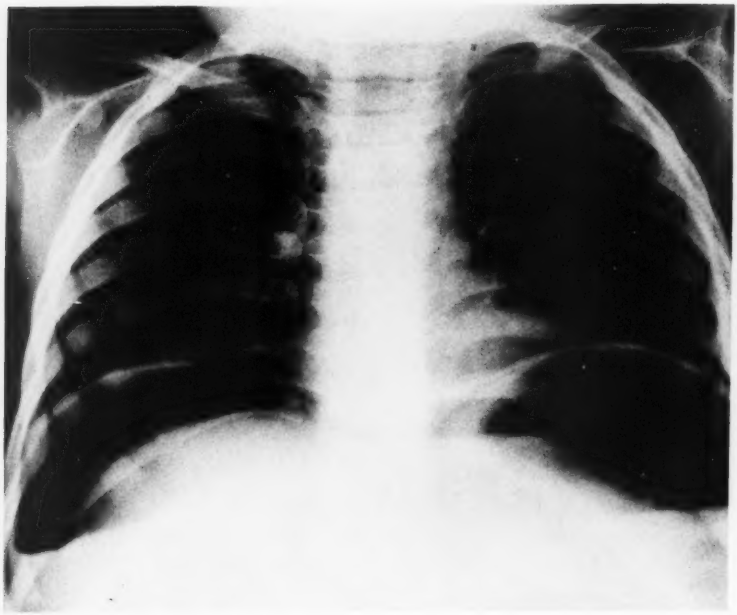

Figure 1. Roentgenogram taken on admission with patient in upright position, showing the presence of a large amount of subdiaphragmatic air.

Laboratory studies on admission revealed the following: hematocrit, 40 per 100 ml; white blood cell count, 7,050 per μl with a differential of 46 per cent neutrophils, 52 per cent lymphocytes, and 2 per cent monocytes; nonprotein nitrogen, 75 per 100 ml; serum chloride, 605 mg per 100 ml; and serum CO_2 capacity, 27 volumes per 100 ml. Urinalysis was essentially negative except for 2 plus qualitative albuminuria.

A polyethylene catheter was placed in the left long saphenous vein, through which whole blood, electrolyte solution, Achromycin (brand of tetracycline hydrochloride), and cortisone were infused. After the patient's condition improved, a laparotomy was performed by right rectus muscle-splitting incision. About a liter of brownish fluid was encountered, and a systematic exploration of the abdomen revealed the fourth portion of the duodenum to be completely divided, 2 cm proximal to the ligament of Treitz. The rupture communicated freely with the abdominal cavity. Two rents in the mesentery of the small bowel, each about 5 cm in length, were noted in the region of the

superior mesenteric vessels. After the abdominal cavity was suctioned clean of the fluid, an end-to-end, two-layer closure of the duodenum was done and the mesenteric rents were repaired. The abdomen was closed with through-and-through stainless steel wires.

Postoperatively the patient's condition was extremely poor for the first 36 hours, after which it improved progressively and steadily. Supportive therapy consisted of antibiotics and cortisone for the first 36 hours postoperatively, plus electrolyte replacement therapy and continuous Wangensteen suction. Bowel sounds reappeared on the third postoperative day. Wangensteen suction was discontinued on the fifth postoperative day. On the fourteenth hospital day the abdominal wire sutures were removed and the child was discharged the next day. He has had normal dietary intake and normal bowel movements since discharge, and appears to be in good health at the present time.

DISCUSSION

The cause of duodenal rupture is usually a blunt but violent blow to the anterior abdominal muscles. When these muscles are relaxed, the full force is transmitted to the duodenum. Many writers have commented on the minimal force that occasionally produces a rupture, and the case presented shows that regardless of how insignificant the history of trauma may be, this injury should be suspected.

Location. About two thirds of the ruptures caused by nonpenetrating trauma to the anterior abdominal wall are intraperitoneal and one third are retroperitoneal.[1] The most common sites are at points of anatomic fixation, such as the junction of the second and third portions of the duodenum and the duodenojejunal junction.

Signs, Symptoms, and Diagnosis. The signs and symptoms of intraperitoneal rupture are those of peritonitis with accompanying generalized abdominal pain, rigidity and spasm, nausea, vomiting, fever, leukocytosis, prostration, and evidence of free air subdiaphragmatically as seen by roentgenographic examination of the upright abdomen. Intraperitoneal rupture almost always makes itself known.

The signs and symptoms of retroperitoneal rupture, however, are variable. There may be only moderate, diffuse abdominal tenderness. Pain varies and there may be no rigidity. Cases have been reported without fever or leukocytosis, and with good general condition of the patient 48 hours after trauma. Retroperitoneal rupture should be suspected when there is roentgenographic evidence of emphysema of the retroperitoneal space, pain in the testicle (presumably due to irritation of the sympathetic nerve chain by duodenal contents along the spermatic artery), pain in the posterior neck when pressure is applied to

the anterior abdominal wall, or air in the region of the right kidney.[2]

Treatment. Immediate diagnosis and surgical intervention is imperative for such a condition. After attempts at correcting shock and electrolyte deficiency, if present, laparotomy should be performed. Retroperitoneal ruptures can easily be overlooked, even with mobilization of the entire duodenum, and should therefore be searched for. Following closure of a retroperitoneal rupture, retroperitoneal drainage should be afforded.

Supportive postoperative therapy in the form of replacement electrolytes, whole blood transfusions when necessary, and antibiotics will decrease the heretofore high mortality of duodenal rupture.

Mortality. The mortality rate has progressively improved. In 1910, Guibé[3] reported a 90 per cent mortality in 134 cases. In 1940, Hinton[4] reported a 45 per cent mortality in 84 cases. In 1949, Siler[2] reported a 20 per cent mortality in 25 cases. Since then there have been isolated cases reported with no mortalities. Certainly with prompt diagnosis and immediate reparative surgery, the mortality in this type of injury can be kept to a minimum.

SUMMARY

Traumatic rupture of the duodenum is a fairly uncommon but well-known entity. The case presented is unique in two aspects: (1) It is believed to be the first reported of complete transverse division of the duodenum caused by nonpenetrating trauma; and (2) the patient is believed to be the youngest reported in the literature, to have been treated successfully for traumatic rupture of the duodenum.

The most common site of rupture is in the relatively fixed portions of the duodenum. Signs and symptoms depend on whether the rupture is into the peritoneal cavity or into the retroperitoneal space. If the rupture is intraperitoneal, the signs and symptoms are those of acute peritonitis. A retroperitoneal rupture may produce a less stormy course with varying degrees of pain, fever, and leukocytosis.

Prompt diagnosis, correction of shock and electrolyte imbalance, and early surgical repair of the rupture will decrease the high mortality of this condition.

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Pituitary Ependymoma

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EPENDYMOMA of the pituitary gland is not generally recognized as a primary lesion and a case is presented below which is considered by us to be a primary ependymoma of the pituitary gland. According to Kernohan and Sayre,[1] intracranial ependymomas are the second most common type of gliomas, occurring on an average between 23 and 24 years of age. In their series, 40 per cent of the ependymal tumors were located supratentorially and 60 per cent infratentorially. Of the latter, 90 per cent occurred in the midline and involved the fourth ventricle or cisterna magna. Antoni[2] proposed that gliomas of the pituitary can arise as ependymomas from the neurohypophysis and stalk. All tumors in this region, then, are not of primary pituitary gland derivation. In fact, Antoni believed that the preponderance of these tumors are ependymal gliomas. Although, anatomically, ependymal lining cells dip into the infundibulum of the pituitary, as illustrated in figure 1, and can conceivably give rise to an ependymoma, there is a remarkable absence of such cases documented in the literature. The question of how often ependymomas of the pituitary occur can be elucidated to some degree by re-examination of tumors of this area and correlation with other applicable information, such as case history and operative or autopsy findings. An organization such as the Armed Forces Institute of Pathology might have material available for such a study.

CASE REPORT

The patient was a 31-year-old woman who after a normal pregnancy three years earlier had had amenorrhea and intermittent lactorrhea. Eight months prior to admission she observed blurred and hazy vision in the left eye associated with photophobia. Two months prior to admission she noted that she was almost blind in the left eye.

The physical examination was negative except for visual field studies which revealed a marked restriction of the visual fields on the left side compatible with the pattern of a bitemporal hemianopsia. The impression was primary opticatrophy due to a chiasmal tumor. Roentgenograms of the skull revealed the pituitary fossa to be enlarged with erosion

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of the posterior clinoid processes. These findings were considered to be suggestive of local pressure effect compatible with a pituitary tumor.

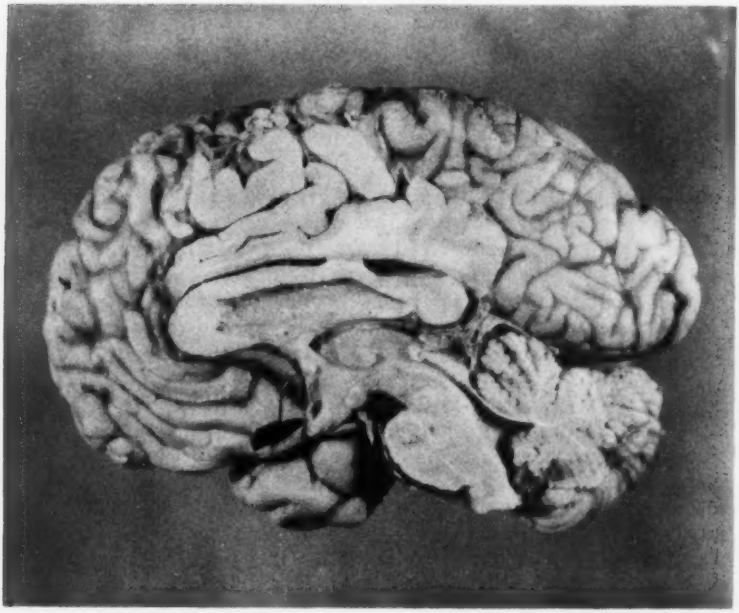

Figure 1. Midline hemisection of a brain specimen, with pointer demonstrating ependymal reflection into pituitary stalk.

On craniotomy a tumor mass was found to have compressed the left optic nerve. The tumor—gray-brown in color, soft, and friable—appeared to be arising from the pituitary gland, and much of the mass was removed. At this time, it was considered to be a chromophobe adenoma. The patient made an uneventful recovery with good visual improvement of the left eye.

DISCUSSION

It is evident that, although anatomically likely, ependymomas of the pituitary gland are infrequently documented.[3-5] In such a case of intracranial neoplasm certain pathophysiologic conditions may be expected due to local mechanical pressure on the optic nerve and pituitary gland. Thus, in the case which is presented above, there are the usual changes associated with hypopituitarism, such as amenorrhea.

The microscopic findings in the tumor (figs. 2 and 3) reveal a characteristic histologic appearance of an ependymoma, consisting of spinal cells with abundant cytoplasm arranged in rosettes and pseudorosettes and radially around vascular channels.

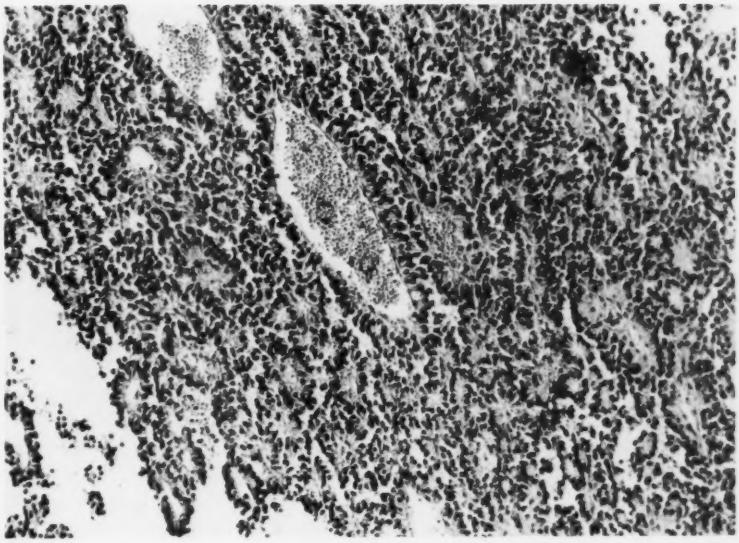

Figure 2. Low-power view of pituitary tumor. (× 100)

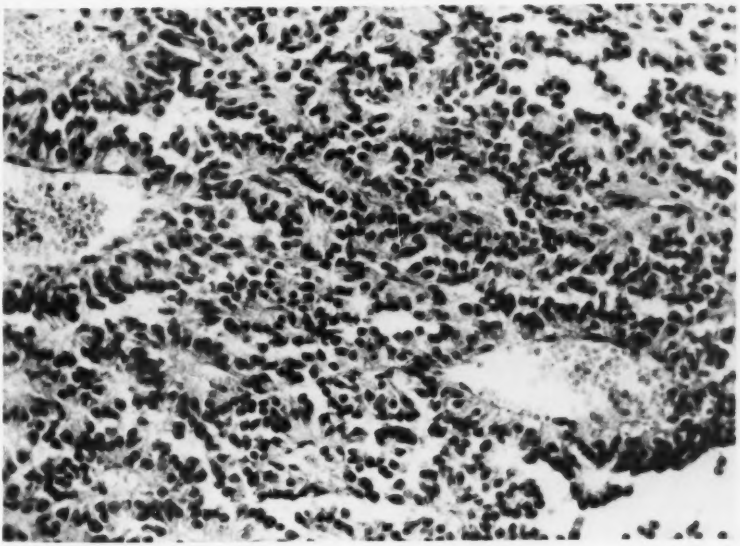

Figure 3. High-power view of pituitary tumor, revealing characteristics of an ependymoma. (× 240)

It would appear that not only are pituitary ependymomas to be expected from an anatomic standpoint but that they also exist clinically.

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HYPOTENSION FROM RAUWOLFIA DURING ANESTHESIA

"Hypertensive surgical patients on Rauwolfia therapy have shown significant hypotension and bradycardia during anesthesia. . . . This appears to be a vagal response enhanced by the vagotonic anesthetics and corrected by the use of vagal blocking drugs.

"Patients on Rauwolfia therapy who are to undergo elective surgery should not receive this drug for two weeks prior to the surgical procedure. The hazards of removing the antihypertensive and tranquilizing effects of these drugs must be considered before discontinuing therapy prior to a surgical procedure. Emergency surgery on these patients may be safely carried out by using vagal blocking drugs to prevent and treat vagal circulatory responses.

—CHARLES S. COAKLEY, M. D.
SEYMOUR ALPERT, M. D.
JOHN S. BOLING, M. D.
in *The Journal of the American Medical Association,* p. 1144, July 1956

Levarterenol in Cardiac Infarction

With Shock and Transient Complete Heart Block

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INFARCTS of the heart causing A-V dissociation are often fatal. Reported here is a case of total block that lasted a week after infarction; during this period, adequate blood pressure was maintained only with the help of Levophed Bitartrate (brand of levarterenol bitartrate). The patient recovered, however, and even a year later cardiac symptoms were no more severe than prior to the attack. Now that hypotension and slow ventricular rates are more easily treated,[1,2] the prognosis in such cases may be better, many deaths being from the cumulative effect of several factors. Cardiac output declines as a result of the infarct, but is apt to drop lower with onset of bradycardia so that hypotension is often severe.[3,4] If fever develops and greater minute output is called for, fixation of rate can be a separate handicap. Ischemia of the myocardium may become so marked as to impair function and favor more dire changes in rhythm.[5] As the following case suggests, this sequence need not occur regularly, and the often transient nature of the block should emphasize the opportunity for therapy.

CASE REPORT

A 54-year-old white male nurse was admitted to the hospital in May 1954 because of substernal pain of 30 hours' duration, associated with nausea and a single emesis. He had had angina pectoris and mild hypertension for 5 years, with an average blood pressure of 170/90 mm Hg. The only other cardiac symptom was dyspnea on moderate exertion, present for 18 months.

On hospital entry, blood pressure was 128/78 mm Hg; heart rate, 82; respirations, 20; and oral temperature, 97.8°F. No signs of congestive failure were present. The heart was not enlarged to percussion, sounds were of good quality, and the rhythm was regular; a soft systolic murmur was heard just to the right of the manubrium, but the second sound was louder here than at the pulmonic region. Except for mild obesity, there were no other pertinent physical findings.

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Examination of the blood revealed a normal value for hemoglobin and a slight leukocytosis, a high percentage of neutrophils being the sole abnormality on smear. The urine was not remarkable. A serum test for syphilis was negative. An electrocardiogram a few hours after entry showed a sinus bradycardia of 50 and changes indicative of a fresh posterolateral infarct with a septal component. The key features were a deep Q wave and S-T segment elevation in lead III; the only notable finding in lead II was a diphasic T wave. In addition, S-T segments were high in leads aVR, aVF, and V_1, but low in leads I, aVL, and V_4 through V_6, the depression being accompanied by T-wave inversion. Position of the heart was intermediate with moderate counterclockwise rotation. P-R and QRS intervals were of normal length, and though all ventricular complexes were slurred, evidence of left ventricular hypertrophy was lacking. A roentgenogram of the chest was not made at this time.

Strict bed rest and oxygen by nasal catheter were provided. Daily doses of phenobarbital were begun and also small doses of morphine as needed to relieve substernal pain. The patient's temperature rose 8 hours after admission to 101.6°F, the start of a marked febrile response that was to last nearly a week. Apart from chest pain and fever, however, the man's course during the first hospital day was uneventful.

The quality of the heart sounds deteriorated by the next morning, and toward midday the pulse rate was regularly around 55. An electrocardiogram at this time showed only typical changes of posterolateral infarction and complete A-V block. The form of the QRS complex was unchanged, indicating a nodal rhythm. The blood pressure began to fall faster and late that afternoon reached 94/60 mm Hg, the patient exhibiting signs of circulatory collapse: anxiety, pallor, and a cold sweat. Fine rales became audible over the lung bases, but other evidence of congestive failure did not develop.

The patient was in this critical state for almost 2 hours before an infusion was started containing 4 mg of Levophed Bitartrate per liter of 5 per cent dextrose in water. Administered at a rate of 20 drops a minute, this restored the patient to preshock status within half an hour. Penicillin was given as prophylaxis, oxygen by tent substituted for the nasal catheter, and in view of a bad prognosis, heparin sodium and Dicumarol (brand of bishydroxycoumarin) were begun.

The rate of flow of Levophed Bitartrate was adjusted to keep blood pressure at about 120/80 mm Hg. A pericardial rub was audible 36 hours after admission and persisted until the next afternoon, the day when some stability in the patient's condition became apparent. Chest pain was milder and less frequent, and in spite of the disposing factors, frank congestive failure was not present. Re-examination of the patient and a second urinalysis failed to disclose an infectious cause for the sustained fever. Penicillin was replaced by a broad-spectrum antibiotic, but the high temperature did not abate.

Late in the third day, the patient complained again of severe substernal pain when the pressor infusion stopped because a clot formed in the needle. There was ashen pallor, and blood pressure was 90/60 mm Hg, changes which proved quickly reversible when Levophed Bitartrate was restarted. This sequence was repeated the next night, and to avoid other similar episodes, a plastic catheter was inserted in an ankle vein. In the process, resumption of this therapy was delayed about two hours, and by then cardiac shock was more advanced. Blood pressure was not recorded lower than 90/60 mm Hg, but the patient was very restless and in a profuse sweat with blotchy cyanosis. Luckily, this deterioration was as easily halted as before.

These bouts of hypotension with each hiatus in therapy are graphed in figure 1. Premature beats were noted at these times, but serial electrocardiograms did not reveal extension of the infarct, showing only evolutionary changes and persistent complete block. The atrial rate was always about twice the ventricular rate of near 50, the form of the QRS complex remaining unchanged.

From the sixth day onward, the patient's course was more favorable as blood pressure was sustained with less Levophed Bitartrate, and both fever and chest pain subsided. Oxygen was continued, however, because the patient became slightly cyanotic if out of the tent for more than a few minutes. Further need for pressor infusion was tested now and then by reducing its rate of flow, the result always being a disturbing drop in blood pressure. The importance of this was substantiated on the eighth day when the patient, in a confused state probably due to barbiturate toxicity, pulled out the venous catheter. Though the full picture of shock did not follow, a marked pallor developed and blood pressure fell to the lowest level in three days (fig. 1). Rational behavior slowly returned once phenobarbital was withheld, and additional Levophed Bitartrate corrected the hypotension.

Eighteen hours after this episode, the ventricular rate rose spontaneously to between 80 and 90, this being the return of A-V conduction after a week of total block. The P-R interval was prolonged for a time, but the period of precarious circulation was over and Levophed Bitartrate was stopped without difficulty, blood pressure stabilizing at 115/80 mm Hg. A total of 52 mg of Levophed Bitartrate had been given, and despite typical problems with its administration, there was no trouble from vasospasm near the sites of infusion. With improvement in cardiac function, antibiotic and oxygen therapy was also discontinued.

After three weeks, no abnormalities of the heart could be detected on physical examination, and a chest radiograph showed cardiac and aortic shadows of normal size and contour. Ambulation was begun and Dicumarol discontinued.

At the end of four weeks the patient left the hospital to begin a prolonged rest at home. A year later, he reported the return of mild hypertension and persistent angina, but congestive failure had not developed

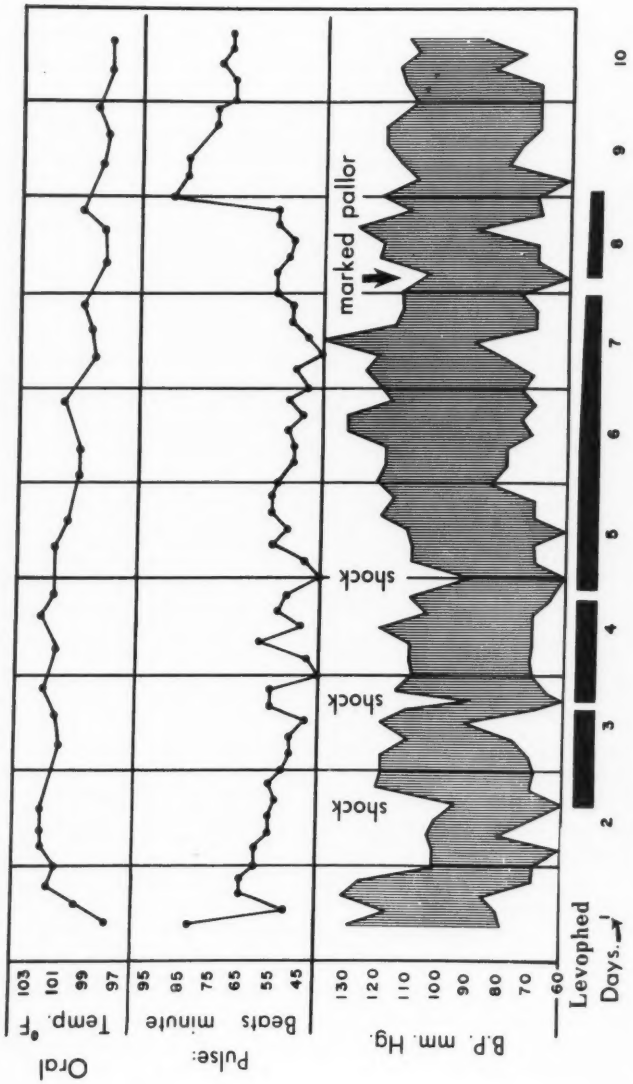

Figure 1. Graph of patient's clinical course showing inability to maintain an adequate blood pressure without Levophed Bitartrate during period of complete A-V block.

nor was there a history of peripheral embolus. He was working full time as a hospital nurse and described his physical limitations as very similar to what they were prior to infarction.

Comment. The crucial role of pressor therapy in the recovery of this patient seems clear. Blood pressure fell rapidly after onset of complete block, and only with Levophed Bitartrate was an adequate level maintained until A-V conduction returned a week later. Hypotension was never marked, but surely cardiac shock existed in view of the clinical picture and the previously high blood pressure. Only at times of circulatory collapse was irregularity of the heart noted, but in cases like this, ectopic beats are often numerous or herald a fatal arrhythmia if hypoxia is not relieved.

Despite the prolonged need for adjuvants, disability seemed the same after recovery, suggesting that much of the acute trouble was related to block. At that time the myocardium was ischemic from hypotension and less able to compensate for the infarcted and inert zone. In turn, low blood pressure was due to decreased systolic power and a slow, as well as fixed, ventricular rate. During the high fever, this rate was no greater than on the seventh and eighth days when the temperature was almost normal and less was demanded of the heart (fig. 1). Fixation of rate was thus an extra factor to limit output at a time when the best possible coronary flow was desirable; although impaired by both the old and fresh cardiac lesions, the stroke volume was being heavily relied on to sustain the circulation. In spite of mild congestive failure, better coronary flow as a result of the rise in blood pressure was enough to restore adequate ventricular function and permit recovery. The effect of Levophed Bitartrate in contracting the peripheral vascular bed probably made this easier. In the patient's favor were the anginal history and high location of the pacemaker, but these features do not detract from this example of the help a pressor agent can be at times.

DISCUSSION

A statistical study alone can show if persons like this patient derive unusual benefit from pressor therapy. Though such benefits have been suspected by other authors, their comment has been brief.[6] This analysis is offered because a large series is hard to collect, yet cases are common enough to make the point of interest. Many articles report the value of Levophed Bitartrate in shock from a cardiac infarct, and the basis for a better prognosis in this material as a whole is granted.[6] Thus, attention is drawn only to patients in whom shock and A-V dissociation occur together and to the unique features they present.

Infarcts causing total block are often associated with a very low output, cardiac indexes of 1 and less being on record.[4] Gen-

erally, so small a value is expected only after a massive infarct or when there is diffuse fibrosis before the attack, cases where the prognosis correlates with the muscular deficit. When bradycardia contributes to the low minute output, however, damage need not be so severe and return of quite good cardiac function is possible. Regardless of stroke capacity, the combination of fresh infarct and slow rate is apt to cause a decline in minute output due just to the vicious effect of ischemia on contractile force.[7] Though pressor therapy alone will not always be as helpful as in this case, these are patients in whom timely preservation of coronary flow can result in striking recovery.

There are other dynamics which should be considered. Diastolic size of the heart may increase with bradycardia, and if there is dilatation initially, fibers can be so stretched that the force of contraction suffers. Also, when hypervolemia exists, the same drop in minute output is a bigger detriment to the circulation than if blood volume is normal, and output can be low indeed when infarction and total block occur together. Further, when atria and ventricles beat out of phase, ventricular blood is now and then ejected past partly open membranous valves back into the venous trunks.[8] Such features reveal how important good coronary flow is to these persons so that avoidable ischemia will not make systole any less effective. Pressor therapy keeps to a minimum the weakness that stems from prior cardiac lesions, at a time when full systolic power may be sorely needed.

Of great interest are aspects of the change in rhythm itself. Total block may appear at the time of infarction or not for a day or more. As the region of the A-V node is protected from infarction by a rich anastomosis, this arrhythmia is usually attributed to hypoxia of that zone,[9] any delay being for ischemia or oxygen unsaturation of the blood to reach a critical level. This is perhaps the rule when block follows an anterior infarct, but if the lesion is posterior, as is usual, conducting tissue can also be caught in the necrosis or the reaction it excites. Onset and duration of block possibly vary on that basis. Inflammation is probably just a minor factor, viable muscle about an infarct having a marginal blood supply that accounts for extension. Extension is more likely if ischemia is aggravated by a marked fall in blood pressure, the very picture infarcts with dissociation are apt to present. It is all the more important to avoid extension in these cases lest block be permanent as a result. Prompt use of Levophed Bitartrate may spare some of these persons this lasting handicap or abolish the arrhythmia and simplify recovery; reports of the latter are already in the literature.[6] With no other group of myocardial infarcts does pressor therapy have this role.

Fixation of ventricular rate is also a problem at times. Complete block is often thought to imply a fixed rate, but Gilchrist's[10]

study of A-V dissociation showed true fixation to be unusual. Regardless of cause, he found a rise of four beats per minute with each degree of fever and a wide range of response to exertion, some persons showing an increase of 50 per cent but others none. That even fever may fail to cause acceleration is seen in figure 1. These differences are probably related to location of the pacemaker and to variable nervous factors, but pertinent here is that fixation occurs. If stroke volume is close to capacity and there is inability to increase heart rate, a febrile illness will challenge the circulation.

When there is fever and need for copious systemic perfusion, limited cardiac output can result in hypotension and a drop in coronary flow. How big a problem total block may be even without pyrexia is shown by the hypometabolism to which chronic cases are prone.[11,12] The febrile response to an infarct is seldom as marked as graphed here, but serious heart disease is often complicated by infection. Whatever the cause, fever combined with a fixed ventricular rate is a grave threat to persons whose stroke capacity is low. In sustaining pressure by a contraction of the vascular bed, Levophed Bitartrate is especially helpful in such patients, this case being an example.

Even with other adjuvants, pressor therapy is unable to meet the circulatory crises sometimes presented, and then an attempt is made to raise ventricular rate. In years past, ephedrine or epinephrine was usually tried, but use of either entails added risk of ventricular fibrillation and better agents are now available. For this purpose, isopropylarterenol hydrochloride (Isuprel Hydrochloride) and sodium lactate are safer and, judging from a variety of reports,[1,13,14] often very effective. These new agents are helpful too in abolishing ectopic foci when, though blood pressure is normal, ventricular speed is so slow as to lead to hypoxic irritability of heart muscle. Quinidine sulfate is unsafe if there is heart block. With bradycardia easier to manage, more chances to treat these cases successfully are likely.

Besides sustaining blood pressure when cardiac output is so limited, effective pressor therapy assures the better perfusion of heart muscle that bradycardia makes possible. During systole, blood vessels in the myocardium are compressed, tachycardia leading to heart failure if diastole becomes too brief for the muscle to be nourished.[15] As a rule, this is seen only with quite rapid rates, but each contraction makes some foci ischemic, those near the endocardium being susceptible to necrosis because they are close to cavitary pressure.[16,17] Also, even moderate tachycardia seems important to avoid if atherostenosis limits coronary inflow or a fresh thrombus blocks a major conduit.[18] If aortic pressure can be kept normal, a slow ventricular rate may allow unusually good perfusion of muscle and the handicap may be turned to advantage. Though hard to prove, this is also suggested by an experiment

showing coronary flow to rise as heart rate falls and greater increments to occur as speeds approach those typical of A-V dissociation.[19] Support is found too in the recent report that angina often disappears with the advent of complete block.[20]

Only a study of many cases can test such concepts and show if these patients derive special benefit from pressor therapy. Notable, however, is a paper by Binder and associates[6] on Levophed Bitartrate in shock after cardiac infarction, the most striking results being in a small group with total block. The poor outlook for these persons is usually blamed on the diffuse coronary atherosclerosis often present,[9] but emphasis on this alone is arbitrary as there seems to be no clinicopathologic review of a large series. As these cases are uncommon, it is hoped this analysis will lead to pooling of experience and more awareness of what therapy offers the occasional patient.

SUMMARY

Infarcts of the heart that lead to complete A-V block are often fatal, yet the high mortality is in part related to the change in rhythm which may be temporary. If coronary flow were sustained during this crucial phase, more of these persons might survive and regain their cardiac function. Vasopressor therapy probably has special value in this situation, as illustrated by the case reported herein. As safe agents are available for raising ventricular rate, there is added reason to recognize the opportunity for treatment that these patients present.

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NOT VITAMINS ALONE

"Many patients in a hospital for chronic diseases had been taking large doses of brewer's yeast over long periods of time—months and years. The utter inadequacy of this therapeutic approach was quickly revealed by a mere glance at the large number of cachectic persons in this group. In other words, vitamins per se, or any other preparation designed to stimulate eating, are totally ineffective without provision of a diet containing sufficient calories. We believe that the treatment for undernutrition is a good diet, not vitamin supplements."

—JOSEPH I. GOODMAN, M. D., and
WILLIAM DOWDELL, M. D.
in *Annals of Internal Medicine*
p. 1256, Dec. 1955

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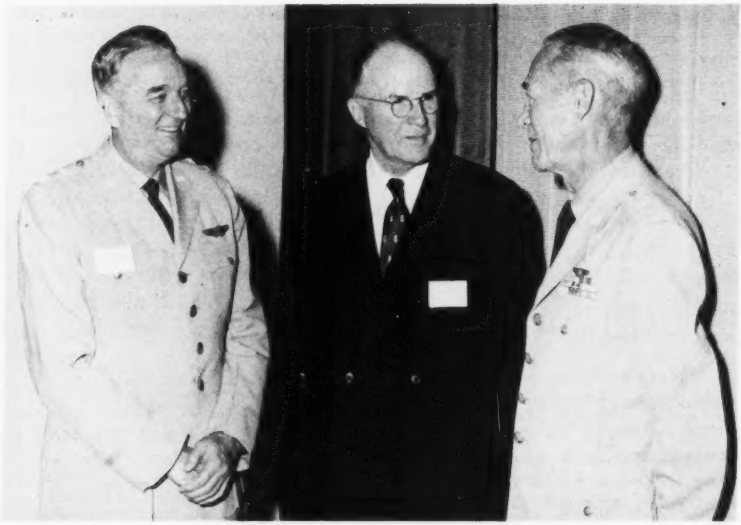
DOCTOR BERRY AND GENERAL OGLE VISIT NEW HOSPITAL

Doctor Frank B. Berry, Assistant Secretary of Defense (Health and Medical), accompanied by Major General Dan C. Ogle, The Surgeon General, Department of the Air Force, visited Brigadier General Edward J. Tracy, the Surgeon, Headquarters Air Materiel Command, USAF, at Wright-Patterson Air Force Base, Ohio, on the occasion of the opening of the new U. S. Air Force Hospital at that base.



The new Air Force area hospital, dedicated at Wright-Patterson on 21 September 1956, has facilities for 300 authorized operating beds, with a potential expansion to 426 beds in an emergency or under mobilization circumstances. Complete medical, surgical, and dental care is furnished to military personnel stationed in the Ohio area. This new modern medical facility is the sixth largest of the Air Force hospitals.

A MESSAGE FROM THE A. M. A.

This past year our monthly "Messages" in this *Journal,* with the exception of the one in the October issue, have been devoted to the varied activities and services offered by the American Medical Association. The first article in the series pointed out that the Association has as its objective the promotion of the science and art of medicine and the betterment of public health. It is a physician's organization existing to serve the physician and the general public.

The major emphasis of the American Medical Association is upon its scientific activities. As the last message of this year, it is most appropriate to discuss the purpose and activities of the Council on Scientific Assembly and the Bureau of Exhibits of the Association.

The Scientific Program at the Annual Meeting of the American Medical Association is the culmination of more than one hundred years' experience in program building. Beginning in 1847, there was a gradual increase in the scope and importance of activities at annual meetings until 1915, when the Council on Scientific Assembly was organized by the House of Delegates to correlate the work of the various sections and to stimulate better programs. Meanwhile, in 1899, the Scientific Exhibit had been organized under a separate committee of the House of Delegates. In 1921, the Board of Trustees took over the Scientific Exhibit and administered it under a committee of three members of the Board. This situation of two program committees competing for the attention of the same audience continued until 1953, when the Council on Scientific Assembly was transferred to the Board of Trustees and combined with the Committee on Scientific Exhibit.

The character of medical meetings has changed markedly even during the last half century. At the meeting of the American Medical Association in Denver in 1898, the year before the Scientific Exhibit was initiated, there were 615 papers listed on the program. These were read by "essayists," few of whom had coauthors. At the last meeting of the Association in Chicago in 1956, with a greatly increased attendance over the 1898 meeting and an increase in the various Sections, the number of "papers" had been reduced to 244, nearly half of which were authored by

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From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense. —*Editor*

two to five persons working in collaboration. Other features of the meeting included more than thirty panels and symposiums on various subjects, over three hundred scientific exhibits covering all phases of medicine, four full days of color television, which brought the operating room directly into the meeting hall, and a spectacular group of motion pictures, many of which were explained by the authors as the pictures were shown on the screen. The spoken word is still necessary to convey information, but medical audiences prefer to be talked "with," rather than talked "at," and to look rather than merely to listen.

More than fifty persons are responsible for different portions of the program for the Annual Meeting, including the Section Secretaries, the Section Representatives to the Scientific Exhibit, and chairmen of various special committees for different activities such as the special exhibit on fractures. All of these report to the Council on Scientific Assembly, which acts as a clearing house to eliminate duplications and conflicts and to co-ordinate all activities into a smooth-working whole.

The Clinical Meeting of the American Medical Association, which was started in 1948, is intended to supplement the Annual Meeting by going to cities that cannot accommodate large crowds. Interest has been increasing in the Clinical Meeting, and many physicians find the program more interesting than the Annual Meeting because of the intimate character of the presentations. There is a full schedule of lectures, round tables, panels, scientific exhibits, color television, and motion pictures, but the Sections do not meet. The program is arranged with the co-operation of a local committee in the city where the meeting is held.

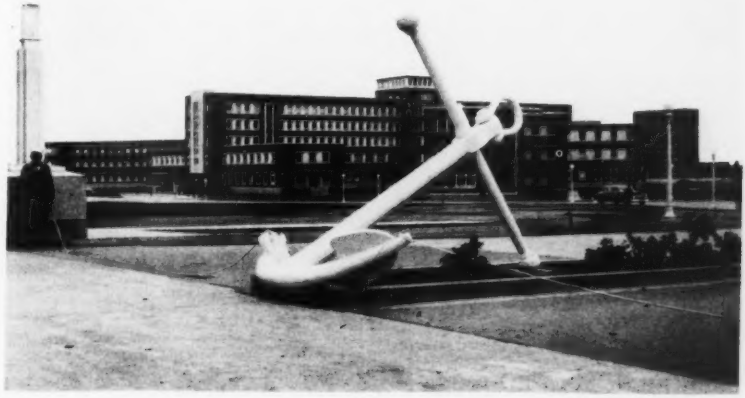
The Bureau of Exhibits, established in 1930, prepares and presents exhibits that depict activities of the various departments of the American Medical Association. The work is carried on in co-operation with the different councils, bureaus, and committees. It furthers both graduate medical education and public health education by graphically presenting scientific and health materials.

Medical exhibits for professional audiences are shown at meetings of state and county medical societies and gatherings of other medical groups and scientific organizations such as dentistry, pharmacy, and veterinary medicine.

Health exhibits for the public are presented at state and county fairs and other public gatherings. Receptive audiences are found at health fairs and expositions as well as at the occasional World's Fair. Museums, both the health museum as found in Cleveland or Dallas and the Museum of Science and Industry in Chicago, reach millions of people who are in a receptive mood for health education.

MEDICAL SERVICE OFFICERS DECORATED BY REPUBLIC OF PERU

At ceremonies dedicating the new Naval Medical Center of Peru on 4 July 1956 at Lima, Peru, Captain Harry C. Oard, MC, USN, and Lieutenant Commander Charles R. Wannamacher, MSC, USN, were awarded the Peruvian Naval Cross for Merit in the grade of Knight Commander—distinguished as White.



The citations, signed by Rear Admiral Alfredo Sousa Almandoz, Secretary of the Navy of Peru, stated that Captain Oard "as advisor to the Medical Department has given exceptional service to the Peruvian Navy. In the pursuit of his duties, at first as Chief and later as Surgeon General of the Medical Department of the Peruvian Navy, he has at all times displayed the invaluable attributes of his professional capability, training, and experience, and has worked with particular interest for the good of that department. Likewise, he has contributed by his zeal and devotion to the excellent organization and function of the new Naval Medical Center, of which he is the Commanding Officer . . . . He has contributed greatly to the longstanding ties of sincere friendship and loyal cooperation which happily exist between the Navies of the United States of North America and Peru."

Lieutenant Commander Wannamacher was praised in the citation by Rear Admiral Almandoz "for the magnificent work which he has performed and continues to perform for the better outfitting of the Peruvian

Naval Medical Center." His efforts have "contributed decidedly in enabling the Naval Medical Center of Peru to fulfill, with true efficiency, its mission for the good of the Navy and the health of its personnel."

Vice Admiral Roque A. Saldías, Secretary of the Navy of Peru, decorating Captain Harry C. Oard, MC, USN, with the Peruvian Naval Cross for Merit.

Lieutenant Gertrude Oard, NC, USNR, wife of Captain Oard, also was decorated with the Peruvian Naval Cross for Merit in the degree of "Officer"—distinguished as White, for as "instructor and advisor in the Art of Nursing in the Hospital Corps School of the Navy (she) has contributed unusually excellent services to the Peruvian Navy."

Among other distinguished guests present at the dedication ceremonies were Rear Admiral Bartholomew W. Hogan, MC, USN, Surgeon General of the United States Navy; Rear Admiral Charles W. Wilkins, USN, Director of Pan-American Affairs, Naval Missions and Advisory Groups Division, Office of the Chief of Naval Operations; Rear Admiral Milton E. Miles, USN, Commandant of the Third Naval District; and Rear Admiral Clarence L. C. Atkeson, USN, Commandant of the Fifteenth Naval District.

The Peruvian Naval Medical Center was built from the plans that were used for the construction of the U. S. Naval Hospital, Beaufort, S. C.

Lieutenant Commander Charles R. Wannamacher, MSC, USN, receiving the Peruvian Naval Cross for Merit from Vice Admiral Roque A. Saldias.

THE HOSPITAL AND THE DOCTOR

Altruism alone does not prompt a doctor, contemplating establishing a practice, to inquire about the hospital facilities of a community. The hardships and inefficiencies of a house-to-house practice, the long vigil at the bedside of a critically ill patient, and the restrictions that are inevitable through distances and lack of trained personnel have little appeal. It is the district served by a good hospital that attracts the members of our profession.

—KARL HOLLIS, M. D.
in *Canadian Medical Association Journal*
p. 774, May 15, 1955

REAR ADMIRAL RYAN HONORED BY REPUBLIC OF PANAMA

The Republic of Panama awarded the Order De Vasco Nunez De Balboa to Rear Admiral Daniel W. Ryan, DC, USN, in a ceremony held in San Francisco on 23 August 1956. The presentation was made by Senor Luis D. Crespo, the Panamanian Consul General in San Francisco, before a distinguished group of consular representatives and military officers from the Twelfth Naval District, Western Sea Frontier, and Marine Corps Headquarters (Department of Pacific). This honor was bestowed on Admiral Ryan for his outstanding accomplishments in fostering closer relationships in the profession of dentistry between the peoples of the United States and the peoples of the Republic of Panama.

He visited the Republic of Panama several times during his tour of duty as Chief of the Dental Division in the Bureau of Medicine and Surgery. He was made an honorary member of the Panamanian Odontological Society in 1955 and for several years has worked closely with the Pan American Institute to further closer professional relations between this country and Panama. Admiral Ryan is presently serving as Inspector of Pacific Coast Naval Dental Activities, with headquarters in San Francisco.

VICE ADMIRAL BOONE RECEIVES DECORATION AND CITATION

Vice Admiral Joel T. Boone, MC, USN (Ret.), was awarded The American Legion Distinguished Service Medal on 4 September 1956 at the National Convention of The American Legion at Los Angeles, Calif., for his "outstanding contribution to his country, his fellow citizens, and his disabled comrades." In presenting Admiral Boone with the highest award The American Legion confers, Past National Commander Paul H. Griffith said, "To every American Legionnaire his name is synonymous with the finest possible hospital and medical care for disabled veterans . . . . It is this service as Chief Medical Director of the Veterans Administration from April 1951 to March 1955, for which The American Legion is particularly grateful."

Paul H. Griffith, Past National Commander of The American Legion, presenting The American Legion Distinguished Service Medal to Vice Admiral Joel T. Boone.

In addition to this honor, Admiral Boone was awarded on 18 September 1956, a Certificate of Appreciation on behalf of the Executives of the Federal Hospitals. Signed by the Assistant Secretary of Defense (Health and Medical); Chief Medical Director of the Veterans Adminis-

tration; Deputy Chief, Labor and Welfare Division, Bureau of the Budget; and the Surgeons General of the United States Army, Navy, Air Force, and Public Health Service, the citation praised Admiral Boone "in appreciation of his great contribution to the advancement of Federal hospital administration through his successively important and strategic assignments as Commanding Officer of the U. S. Naval Hospital, Seattle, Wash., Executive Secretary of the Department of Defense Committee on Medical and Hospital Services of the Armed Forces, Inspector General of the Medical Department of the U. S. Navy, and culminating his distinguished civilian service as Chief Medical Director of the Veterans Administration.

Vice Admiral Boone also holds the Medal of Honor, the Distinguished Service Cross, the Silver Star with five Oak Leaf Clusters, and the Purple Heart with two clusters.

USAF VETERINARY OFFICER QUALIFIES FOR OLYMPIC TRACK AND FIELD TEAM

Captain Adolf Weinacher, USAF (VC), won the National Amateur Athletic Union 50,000-meter walk at Baltimore, Md., on 16 September 1956. This was the final elimination for the forthcoming Olympics. He is presently training with the Olympic Track and Field Team on the West Coast prior to his departure for Australia.

Captain Weinacher is a native of Detroit, Mich., and received his Doctor of Veterinary Medicine degree from Michigan State College, School of Veterinary Medicine, in 1951. He completed a tour of duty in the Far East and is presently assigned as Base Veterinarian at Willow Run Air Force Base, Belleville, Mich.

CORRESPONDENCE

(The following letter, which was recently received by The Honorable Albert Pratt, Assistant Secretary of the Navy (Personnel and Reserve Forces), is published with the writer's permission. Dr. Watkins is now at 300 Longwood Ave., Boston 15, Mass. —Editor)

My Dear Mr. Pratt:—Having just completed a two-year tour of obligated duty in the Medical Corps of the Navy, I want to take this opportunity of stating what a magnificent impression the quality of the Navy Medical Corps has made upon me. Prior to entry on active duty, I was on the faculty of the Harvard Medical School and was practicing surgery at the Children's Hospital here. As a consequence, I entered the service with the usual doubts and prejudices of a "congenital civilian," but was soon pleased to find working conditions second to none and dedicated care of patients found only in the top civilian medical institutions. I just cannot agree with the criticisms that have been raised recently by obligated-service officers. I doubt that these people have any true recognition of the problems besetting the military, or have had great experience with the headaches one encounters of a very similar nature in civilian medicine. Naturally, there is always room for improvement of medical efficiency in either military or civilian institutions, but it seems to me that the Navy is doing as good a job of effecting these improvements as any of the numerous high-caliber civilian institutions I have seen.

The best way I can express my admiration for Navy Medicine is to state that I am applying for extension of my commission in an active Reserve Unit. Only extensive prior obligations in my profession prevent me from making Naval Medicine a career. Moreover, it is a great pleasure for me to be able to contribute actively to the Navy's program by acting as a Surgical Consultant at the U. S. Naval Hospital, Chelsea, Massachusetts.

ELTON WATKINS, Jr., M. D.

DEATHS

JACOBS, David Clark, Captain, MC, USAR, of Three Rivers, Mich.; stationed at U. S. Army Hospital, Fort Carson, Colo.; graduated in 1953 from Wayne University College of Medicine, Detroit, Mich.; commissioned a First Lieutenant in the U. S. Army Reserve 27 January 1955 and ordered to active duty on 1 April 1955; died 24 September 1956, age 28, at U. S. Army Hospital, Fort Carson, of multiple injuries and a skull fracture resulting from an aircraft accident.

McGILVRAY, John Hugh, Major, VC, USAR, Sioux Falls, S. Dak.; 9953 Technical Unit, Medical Holding Detachment, Fitzsimmons Army Hospital, Denver, Colo.; graduated in 1942 from School of Veterinary Medicine, Iowa State College; commissioned a First Lieutenant in the U. S. Army Reserve and ordered to active duty 17 December 1943; died 1 July 1956, age 44, at Fitzsimmons Army Hospital, of malignant melanoma.

VOSGERAU, Lucile Henriette, Lieutenant Commander, NC, USN, of Denison, Iowa; stationed at U. S. Naval Medical School, National Naval Medical Center, Bethesda, Md.; graduated in 1935 from the University of Iowa Hospital Training School, Iowa City, Iowa; appointed an Ensign in the Nurse Corps of the U. S. Navy in July 1936; died 12 October 1956, age 46, at the U. S. Naval Hospital, Bethesda, Md., of metastatic tumor of the spinal column.

WILLIAMSON, Walter Scott, Captain, MC, USA, of Burden, Kans.; stationed at Brooke Army Hospital, Fort Sam Houston, Tex.; graduated in 1950 from the University of Oklahoma School of Medicine, Oklahoma City, Okla.; appointed First Lieutenant, USAR, 9 November 1950; commissioned Captain in the U. S. Army 4 October 1954; died 8 July 1956, age 34, at Brooke Army Hospital, of thrombosis of the right coronary artery.

DISCONTINUANCE OF PROMOTIONS OF OFFICERS' SECTION

The number of promotions of Armed Forces medical personnel has *happily* become so large that space limitations make it impossible to report all of them in this *Journal* within a reasonable time after they are officially announced. Inasmuch as promotion lists are widely available in other service publications almost immediately upon release, our Promotions of Officers section is being discontinued until further notice—*Editor.*

Reviews of Recent Books

Rosenau PREVENTIVE MEDICINE and PUBLIC HEALTH, by *Kenneth F. Maxcy,* M. D., Dr. P. H., with 27 contributing authors. 8th edition. 1,465 pages; illustrated. Appleton-Century-Crofts, Inc., New York, N. Y., 1956.

In this new edition of Rosenau's classic textbook of preventive medicine and hygiene, Dr. Maxcy has altered the title to *Preventive Medicine and Public Health* in order to emphasize the full scope of the work. This change emphasizes the well-deserved role of the book as a basic reference for the student in public health and for the public health worker. About 44 per cent (or 634 pages) of the text of the seventh edition has been rewritten, either completely or in part. While the changes bring the material up-to-date and add newer references, the basic character and format remain the same. The length of the work is the same. The identical 27 contributors have been retained, as in the seventh edition, and the index is expanded and more comprehensive.

The sections on Trematode diseases and the chapters on epidemiology, statistical reasoning, and health of the population remain unchanged, as is the material on air-borne diseases, mental hygiene, and meningococcic meningitis. The chapter on tuberculosis has been completely rewritten, as well as much of the chapter on poliomyelitis, particularly in connection with control measures (vaccination). A new section on Coxsackie virus infections has been added. Changes in Section Nine, "Public Health Organization and Activities," dealing with the National Health Services, reflect the reorganization of the U. S. Public Health Service under the Department of Health, Education, and Welfare.

Preventive medicine officers of all services should be pleased with the new edition and will undoubtedly continue to regard it as the basic text of their professional libraries. Every military surgeon should have this book in his possession, especially in view of the present lack of any comparable up-to-date work on military preventive medicine.

—*PHILIP R. BECKJORD, Col., MC, USA*

CAMPBELL'S OPERATIVE ORTHOPAEDICS, Volumes One and Two, by *J. S. Speed,* M. D., and *Robert A. Knight,* M. D. 3d edition. Volume I, Chapters I to XIII, pages 1-1104. Volume II, Chapters XIV to XXVI, pages 1105-2124. 1,323 illustrations including two color plates. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $40 for two volumes.

From the publication of the original one-volume edition by Dr. Willis C. Campbell in 1939 to this two-volume third edition, this work has been, and remains, the very finest source for information covering the entire field of the operative aspects of orthopedic surgery. The original edition was essentially a compilation of almost all operative procedures then proposed for any given orthopedic condition. It had the shortcoming

of offering to the resident, or to those less versed in the specialty, very little discrimination or choice between the many alternative procedures described. The second edition (1949) corrected this deficiency in a major degree by presenting discussions of the orthopedic conditions, indications for surgery, and opinions and preferences concerning the alternative operative procedures described. This third edition, edited by Drs. J. S. Speed and R. A. Knight, continues this latter method of presentation to an even greater degree, and, in addition, offers more material in the fundamentals of the orthopedic conditions and surgical principles. As an example, a new 48-page chapter on surgical physiology is included.

A chapter-by-chapter comparison of this edition with the seven-year-old second edition indicates that the new is by no means just a barely revised later edition of the old. The 1,643 pages of the second edition, with 1,141 illustrations, have grown to 2,124 pages with 1,323 illustrations, and the greatly expanded bibliographies at the end of each corresponding chapter further attest to the effort that has been made in following the orthopedic literature and including the newer developments that have transpired since publication of the second edition.

This is truly an outstanding publication in all respects. The superior presentation of the material is augmented by excellent printing with easily read type, readily identifiable headings and subheadings, excellent reproduction of illustrative material, and complete author and subject indexes. Every orthopedic surgeon will want to own this two-volume set, and every resident in training should have access to it. Since the price may be a deterrant to the resident, each training hospital must be sure to procure the work for its library.

—JOHN D. BLAIR, Col., MC, USA

FLUID BALANCE HANDBOOK FOR PRACTITIONERS, by *William D. Snively, Jr.*, M. D., and *Michael J. Sweeney*, M. D. 326 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $6.75.

This book is written in a clear and understandable fashion with frequent use of easy-to-follow diagrams, and I believe the authors have accomplished their purpose. Parts 1 and 2 on foundation facts and clinical diagnosis have no equal as a primer on water and electrolyte balance. This portion was easy and pleasant to read in a single sitting, and any oversimplification can be forgiven for this reason. The concept of ready-made electrolyte solutions is introduced, and the reader is confronted with the terms "balance solution," "pump-priming solution," and "replacement solution," each of these categories being broken down into several complex multi-electrolyte solutions which are designed to fit the individual disease states. Examples are given of calculations of the proper amounts of electrolytes to be given.

The association of the authors with Mead Johnson and Company has led to their use of solutions manufactured by this company and probably not available from other sources in the same form. The organization and

plan of approach in this book is the simplest that has come to the attention of this reviewer. A certain number of arguments and conflicting opinions are presented, challenging the doctor to make his own decisions.

The book is most useful as a quick reference for those who are reviewing material in this field and particularly so for those who desire immediate information in therapy of problem cases of fluid balance. Each chapter has a bibliography and a brief summary, and the index is excellent.— *RAYMOND A. LAWN, Col., USAF (MC)*

GENETICS, The Modern Science of Heredity, by *Edward O. Dodson.* 329 pages; with illustrations by *Frederick S. Beckman.* W. B. Saunders Co., Philadelphia, Pa., 1956. Price $6.50.

This is a textbook of genetics brought up to present-day standards. It provides a condensed and precise description of our actual knowledge of genetics and at the same time points out problems awaiting further research. It is meant to be a companion for the student of genetics in the classroom. It, however, does provide "more material than can be encompassed in a one-semester course."

The course for which this book is written is developed from elementary facts of heredity as represented by the original mendelian rules and proceeds to more complicated subjects such as biometrics, the structure of the chromosomes, and the modifications of the simple inheritance mechanism by crossing over and mutation. There is a full discussion of the localization of the genes within the chromosomes according to the theory of Morgan, and the position effect as represented by Goldschmidt. Special chapters deal with recent research of cytoplasmic as opposed to chromosomal inheritance and with the influence of modern genetics on our views on evolution. Finally, there is a reprint, in English translation, of the original papers of Mendel himself.

Aside from and beyond the basic knowledge it provides, this book includes valuable direct data on inheritance of normal and pathologic conditions in man. The bibliography, carefully chosen to include every subject discussed, enables the student to run down the original sources if he so desires. This book should be in every medical library for general information and reference.— *JULIUS M. AMBERSON, Capt., MC, USN*

COLLAGEN DISEASES Including Systemic Lupus Erythematosus, Polyarteritis, Dermatomyositis, Systemic Scleroderma, Thrombotic Thrombocytopenic Purpura, by *John H. Talbott,* M. D. and *R. Moleres Ferrandis,* M. D. 232 pages; 30 figures; 16 plates in color. Grune & Stratton, Inc., New York, N. Y., 1956. Price $6.50.

This is a superb review of the collagen diseases that carry grave prognoses, and thus omits from review many diseases considered to be collagen disorders but not accompanied by the ominous outcome of those described. Included in this review are systemic lupus erythematosus, polyarteritis, dermatomyositis, systemic scleroderma, and thrombotic thrombocytopenic purpura. Each of the above diseases is analyzed under the following headings: history, incidence, relation to other collagen

disorders, etiology and pathogenesis, clinical findings, laboratory findings, diagnosis, and clinical course and treatment.

Needless to say, a work such as this by an authority such as Dr. Talbott leaves nothing to be desired in the completeness and clarity of the material covered. There are 540 references cited in the bibliography. An index of subjects is included, as well as eight pages of excellent colored prints of photomicrographs and photographs of skin manifestations. This book will no doubt become the "bible" of collagen diseases, at least of the five covered. Unfortunately, there are many disorders of collagen that are omitted, but, as explained by the author, it is not intended to be exhaustive or encyclopedic in its scope. I believe a work such as this that would include all diseases of collagen would be of immeasurable value.

This book is a must for anybody concerned with the diseases of collagen, but especially for internists and pathologists.

—DAVID I. DEUTSCH, Lt. Col., MC, USA

CLINICAL MANAGEMENT OF RENAL FAILURE, by *Maurice B. Strauss*, M. D., and *Lawrence G. Raisz*, M. D. American Lecture Series, Publication No. 284, A Monograph in American Lectures in Urology, edited by *Reed M. Nesbit*, M. D. 114 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $2.75.

The authors have compressed a vast literature on renal failure into less than 100 small pages of large print. The essential points in diagnosis, etiology, pathology, function, and treatment are summarized in a concise, readable style. Much of the material is derived from the 105 references, but the experience and judgment of the authors are drawn on to resolve controversial points.

The brevity of this account has much to recommend it, but certain omissions in the section on acute renal failure could lead to serious consequences if the reader attempted to manage a patient by employing the recommended measures. For examples: (1) Retrograde pyelography is recommended to rule out ureteral obstruction during oliguria. It should be added that only one ureter should be catheterized, because that is adequate for diagnosis and since the procedure itself can precipitate anuria, it should be employed sparingly. (2) Dehydration is listed as a cause for moderately severe oliguria. It should be emphasized that at least 300 cc of urine per day are excreted in severe dehydration if the blood pressure is not depressed. Many instances of overhydration could be avoided if this fact were generally known. (3) Antibiotic therapy in full doses is recommended for oliguric patients with papillary necrosis. The reader may not know that 0.5 gram of Streptomycin may cause a therapeutic blood level for many days, that larger or frequent doses may cause serious toxicity, and that a second dose should not be given until the blood concentration is known. (4) Glucose infusions are recommended at 12-hour intervals, but no reasons are given for the intermittency. Because others have given reasons for advocating continuous infusions, this omission makes the

present recommendation appear arbitrary. (5) The hazards and the complexities of artificial kidney dialysis are roundly emphasized, and detailed reference is made to mishaps which "have occurred in most centers." Perhaps the experience cited was during the pioneer days of dialysis; certainly it is not representative of the last several hundred dialyses performed in military centers. The reader should have more encouragement to refer his patient to a renal center.

Although the abbreviation of discussion may be misleading on certain points, there is much wise counsel in this small book. It is not offered as a complete review of the subject but ". . . is intended to give the practicing physician and student a basic foundation for understanding the pathologic physiology of renal failure . . .".

—*WILLIAM H. MERONEY, Lt. Col., MC, USA*

THE RELATIONSHIP BETWEEN SYRINGOMYELIA AND NEOPLASM, by *Charles M. Poser,* M. D. American Lecture Series, Publication No. 262, A Monograph in American Lectures in Neurology, edited by *Charles D. Aring,* M. D. 98 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $3.50.

Two hundred and thirty-four published cases of syringomyelia in association with neoplasm of the central nervous system are analyzed by the author. Only autopsied cases are included in his study. He finds a more than casual relationship between intramedullary neoplasm and syringomyelia as well as indications of connecting pathologic links between syringomyelia, central neurinoma, pheochromocytoma, Lindau's disease, Bourneville's disease, and Von Recklinghausen's disease. Based on these considerations he concludes: "From the evidence gathered in this series it would seem that syringomyelia and its associated central nervous system neoplasms can best be explained on the basis of congenital anomalies resulting from faulty closure of the dorsal raphe with glial or mesodermal inclusions at the site of the faulty closure or at other locations in the central nervous system. The neoplasm and the syrinx are then the result of faulty differentiation, possibly a process similar to the one that in its extreme form results in one of the phakomatoses."

The main purpose of this monograph in reporting all published cases of syringomyelia in association with neoplasm of the central nervous system seems to be substantially fulfilled; the secondary purpose of making available a large series of autopsy-proven cases of intramedullary neoplasm of the spinal cord also has been accomplished to a significant degree. The expressed concept may provide a point of departure for further speculation and subsequent investigation directed toward a definitive cause of syringomyelia and neoplasia.

In addition to accomplishing the author's purpose, the monograph provides an ample bibliography and a number of sidelights on syringomyelia and cord tumors which may be of interest to the neurosurgeon, research neurologist, or clinical neurologist as well as the neuropathologist.—*ARTHUR J. LEVENS, Lt. Col., MC, USA*

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INTRODUCTION TO HEPATIC SURGERY, by *Henry Gans*, M. D. with an introduction by *A. Brunschwig*, M. D. 292 pages; 120 illustrations. Elsevier Press, Inc., Houston, Tex., 1955. Price $12.

This book is apparently the first to deal exclusively with the surgery of the liver. It contains an excellent historical review of the development of anatomic knowledge concerning the liver. The many fine illustrations of injected specimens of the liver and diagrams show nicely the segmental nature of the intrahepatic structures and their relationship to the external divisions of the liver. The major relationships and their variations of the ductal and vascular trees at the hilum and within the hepatic segments are well portrayed with injected corrosion specimens. The Latin anatomic terminology used throughout the book is confusing and difficult to follow. The use of English terms would make this book easier to read.

Indications are given for hepatic surgery in primary and metastatic tumors of the liver, carcinoma of the gallbladder, and in injuries of the liver. These indications appear to be sound for the most part but are gleaned from a review of the literature. In fact, the impression gained from reading this book is that, except for the anatomic studies, most of the material is a summary of world literature.

The operations described could have been presented in greater detail as it would be difficult to perform one from reading the text. The author indicates that most of the operations were done on dogs and few on humans. This lack of case experience detracts from the value of the book as a clinical text.

Pre-operative preparation of patients for hepatic surgery and post-operative care including complications are discussed. The appendix discusses the author's injection-corrosion technic for anatomic study of the liver and suggests that a technic for hepatography be developed to accurately localize hepatic tumors.

This book contains much material of interest to surgeons dealing with hepatic problems. It is incomplete in that it does not cover the subject of portal hypertension; physiology is not included, and the section dealing with operative technic is sketchy. It does, however, seem to fulfill the author's purpose, namely, "to present important aspects of the anatomy and surgery of the liver and to interest investigators in the problems yet to be solved."

—*JOSEPH J. ZUSKA, Capt., MC, USN*

THE LEGACY OF SIGMUND FREUD, by *Jacob A. Arlow*, M. D. 96 pages. International Universities Press, Inc., New York, N. Y., 1956. Price $2.

Nineteen hundred and fifty-six marks the passing of a century since Sigmund Freud was born in Freiberg in Moravia. The author of this book was a member of the Freud Century Committee of the American Psychoanalytic Association and a part of his duty as a member of that committee was to arrange a display of Freud's writings for the general public. In this small but handsome volume, Dr. Arlow sets forth on

permanent public display the high points of the vast and almost unbelievable legacy of work and writing left to us all by the genius of Sigmund Freud.

Seldom has so much material (legacy) found its way into such a small and readable book (96 pages). In 11 very well-organized, factual, and unemotional chapters, the variety and the depth of the legacy are presented. Where possible the contributions are presented chronologically, beginning with Freud's early contributions to the field of marine biology and his basic contributions to neurology and neuropathology (aphasia and cerebral paralysis in children). Then follows a short chapter on Freud's little-known contribution as translator of the works of Charcot and Bernheim on neurology, hypnotism, and suggestion. Other chapters trace the development of psychoanalysis as a psychotherapeutic tool and as a body of theory and knowledge aimed at understanding and explaining mental phenomena. Also discussed are Freud's contributions to such extraclinical areas as jokes and wit, literature, pathography, religion, mythology, anthropology, and sociology where he shed light by using psychoanalysis as a research tool. One chapter pays deserved homage to Freud's great literary style and talent.

This book is recommended to anyone with even the slightest interest in the mental life of mankind. It is also recommended to the student of mental phenomena as a guidebook to the appreciation of the stature of Freud and as a handbook to an intelligent approach to his writings.

—*ROBERT E. SWITZER, Comdr., MC, USN*

ALCOHOLISM, Its Psychology and Cure, by *Frederick B. Rea.* 143 pages. Philosophical Library, New York, N. Y., 1956. Price $3.50.

It would be quite easy for the serious student of psychopathology to set aside this book after a cursory reading, for it has many deficiencies. Some are understandable, reflecting the philosophic bias of the author. Others are less excusable and involve grave errors in publication technic. As an example, the academic background of the author, his institutional connection, and the nature of his experience with alcoholics are never mentioned. The organization of the book seems clumsy and some passages are unclear.

Yet for a brief book it covers a good many points of view that are ordinarily omitted from a volume directed at the psychiatrist or psychologist. As such it is a worthwhile introduction to the topic of alcoholism from a more generalized frame of reference than is often found in usual psychiatric literature. The section on addiction covers four main theories of the etiology of alcoholism, stresses the complexity and probable multidetermination of the problem, and reflects the author's personal preference for a "sin and will power" type of explanation. This early half of the book also covers cultural, religious, and national differences in the incidence of alcoholism, and the unequal sex ratio found in this area of psychopathology. Such discussion is excellently documented and is of considerable value.

Another section covers therapeutic aspects of the phenomenon, and involves mainly a discussion of aversion treatment, the Alcoholics Anonymous movement, and the role of the pastor in working with alcoholics. It is in his analysis of the conversion aspect of the treatment of alcoholics that the author makes his best contribution, and it is from a careful study of this analysis that even the most sophisticated and experienced psychiatrist or psychologist may well profit. For the conversion phenomenon, while generally little understood, appears to be an essential part of the successful treatment of alcoholics. It would seem that therapy as applied by groups such as Alcoholics Anonymous is deserving of more systematic study and certainly a wider understanding by the psychiatrist who is so frequently called upon to treat alcoholic addiction.

If the scientific reader is willing to tolerate a heavily loaded philosophical approach to alcoholism in exchange for carefully worked out and up-to-date statistics on the subject plus a fascinating discussion of alcoholic attitude change (conversion), the book may be worth the price. On the other hand, if an orthodox psychologic or psychoanalytic explanation is being sought, this book may be a poor choice.

—WALTER J. GLEASON, Capt., MSC, USA

EXCITABILITY OF THE HEART, by *Chandler McC. Brooks*, Ph. D., *Brian F. Hoffman*, M. D., *E. E. Suckling*, M. Sc., M. E. E., and *Oscar Orias*, M. D. With a Foreword by *Carl J. Wiggers*, M. D. 373 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1955. Price $6.50.

This monograph is the result of the authors' research to re-investigate the basic physiology of cardiac muscle using modern technics and apparatus developed for the study of the excitability of nerves.

It concerns the specific subject of cardiac excitability and consists of 12 independent but complementary chapters. Beginning with a historical synopsis, the subjects covered include the general nature of excitability; methods of studying cardiac excitability; the excitability cycle of the heart; transmembrane potentials of cardiac muscle; fibrillation and the agents which cause and prevent it; the effects on cardiac excitability of temperature changes, inorganic ions, autonomic nerves, and chemical mediators; and the mechanical responses of the heart and their relation to the excitability cycle. The book concludes with a consideration of the comparative physiology of the heart and a summary of the major points of the monograph.

The material is presented in a well-written and lucid manner and is generously referenced. The results of recent research on cardiac excitability are analyzed in relation to both the classical experimental physiology of the heart and the modern concepts of excitability of tissue in general. This monograph represents an outstanding work of continuing significance in the field of basic physiology and should appeal to all who have interest in this subject.

—CHARLES H. STEINMETZ, First Lt., USAF (MSC)

SKIN SURGERY, by *Erwin Epstein,* M. D., and 17 contributors. 228 pages; 242 illustrations on 101 figures. Lea & Febiger, Philadelphia, Pa., 1956. Price $7.50.

This book covers every modality of operative dermatology from cold steel surgery and electro-surgery to such special technics as chemosurgery, tattooing, dermabrasion, et cetera. The individual chapters are contributed by various recognized dermatologists and surgeons. Because of multiple authors, there is some overlapping of material and minor differences of opinion.

The material on skin grafting, oral plastic surgery, and treatment of advanced visible cancer comprises over one third of the book. While this is instructive it is not considered within the realm of what is usually thought of as dermatologic surgery. The remainder of the material is complete and to the point. Illustrations are generally excellent.

The book is recommended for dermatologists and others performing minor skin operative procedures.— *VINTON HALL, Capt., MC, USN*

PRINCIPLES OF HUMAN PHYSIOLOGY, by Sir *Charles Lovatt Evans,* D. Sc., F. R. C. P., F. R. S., LL. D. With Chapters on the Special Senses by *H. Hartridge,* M. A., M. D., Sc. D., F. R. S. Originally written by *E. H. Starling,* M. D., F. R. C. P., C. M. G., F. R. S. 12th edition. 1,233 pages; 721 illustrations, some in color. Lea & Febiger, Philadelphia, Pa., 1956. Price $12.50.

The marked advances in the past 30 years in all fields related directly to physiology, *i. e.,* biophysics, biochemistry, et cetera, have brought physiology closer to the description of the "how" of every process in the body. In the continued observation of the "how," anatomy, histology, and even comparative anatomy are evoked for their clues to function.

Sir Charles Lovatt Evans has continued to approach his study of physiology from the viewpoint of "adjustment of internal to external relations." The complexity and organization of the human system is extremely well reflected in this text. Throughout each chapter, the reactions of the functional organic components of the body are described and analyzed in relation to changes in environment and in adaptive phenomena.

The presentation of physiology in this volume is marked by an excellent sense of value in the inclusion and integration of such related sciences as histology, anatomy, physics, and biochemistry. This overlap of the basic sciences with physiology is clearly seen in the first three chapters on structural principles, biochemical principles, and biophysical principles plus the following chapters on colloids, solutes, and enzymes.

To fulfill the purpose of this work it has been necessary to present the subject from the viewpoint of basic science, and Dr. Evans has succeeded admirably. However, there is a substratum of clinical correlation with the normal, and the volume in the reviewer's opinion could

well be on the desk of a college science student or a premedical or medical student, or may serve as a refresher reference source. The format, index, and illustrations are well adapted to the text, which is scholarly and comprehensive.—*RALPH M. MUGRAGE, Capt., MC, USN*

THE YEARBOOK OF MODERN NURSING 1956, A Source Book of Nursing, edited by *M. Cordelia Cowan.* Foreword by *Mary M. Roberts.* 446 pages. G. P. Putnam's Sons, New York, N. Y., 1956.

This first yearbook to be published for the nursing profession deals with a broad range of topics, from a discussion of the art of nursing to a commentary on future patterns for the profession. After an analysis of the scientific basis of nursing, there are some 115 pages devoted to digests of current articles on patient care, with annotated bibliography and reference lists. The current nursing educational programs are summarized, the purposes and functions of national nursing organizations reviewed, and the various programs of all governmental nursing services are presented by representatives of these organizations.

The reader finds listings of official nursing publications, state and national, and a "directory of organizations and agencies of importance to nurses." The book is a compact and well-organized presentation of the nursing profession as it exists today. This first "Yearbook of Modern Nursing" is a valuable and complete reference book.

—*FRANCES E. QUEBBEMAN, Comdr., NC, USN*

SYNOPSIS OF GENITOURINARY DISEASES, by *Austin I. Dodson,* M. D., and *J. Edward Hill,* M. D. 6th edition. 330 pages; 124 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $4.85.

The subject material of this book is well organized, brief, and to the point. The recognized principles of the practice of urology are presented, and indications for cystoscopy and other specialized methods in diagnosis and treatment are clearly defined. The major subjects are covered by an orderly discussion of their etiology, pathology, symptoms, diagnosis, and treatment, and are well illustrated by photographs and drawings.

An outstanding feature of this book is the fact that the author has improved and kept it current during the years by frequent revisions, especially with reference to treatment and specific therapeutic agents. For example, the material on antibiotics and chemotherapeutic agents has been rewritten, a new section on minor surgical procedures has been added, and the chapter on the treatment of infections of the genital tract has been extensively revised.

The author is an authority and a well-known teacher in this field, and this book would be a desirable addition to the library of anyone interested in this specialty. As it presents a review of the essential facts in the field of urology, it is particularly valuable for the student who needs to obtain a quick grasp of the subject prior to detailed study.

—*JOHN A. SCHINDLER, Col., USAF (MC)*

PERIODONTAL THERAPY, by *Henry M. Goldman,* D. M. D., F. A. C. D., *Saul Schluger,* D. D. S., and *Lewis Fox,* D. D. S., F. A. C. D. 565 pages; 190 text illustrations and 100 plates. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $18.75.

This book was written primarily to prod periodontal teaching, to stimulate imaginative thinking along periodontal problems, and by the presentation of many sides of the individual problem to generate possible solutions in many cases. The authors adhere strictly to their title and present clinical therapy throughout the text. The subjects are grouped in a simple arrangement which makes for easy reading.

The photographs are superb. No credit, however, has been given to the photo technician. The art illustrations and combinations of photographs and drawings are visual-aid masterpieces. The artist, Robert H. Ullrich, Jr., has portrayed one single fact in each drawing in a way that attracts attention to that fact quickly and simply. Actually, a tremendous amount of clinical knowledge could be gained without reading the text because of the numerous concise, definitive illustrations.

References are necessarily limited because the book is a series of individual clinical presentations. The references are found at the end of each chapter, but are not specific to any particular sentence or paragraph in the chapter.

Recognized controversial periodontal subjects are presented in the form of problems with the authors trying to provoke the reader into making a practical decision.

The chapters concerning temporary splinting, periodontal prosthesis, periodontal orthodontics, and occlusal adjustment create a valuable text for the general practitioner as well as for allied dental specialists in addition to the periodontist. Dental societies have been clamoring for a more practical presentation of periodontal therapy for several years, and this book should fulfill that requirement. This book is an efficient quick reference and an intensely interesting textbook for the searching student.—*HENRY B. FITCH, Lt. Col., DC, USA*

MODERN TRENDS IN ORTHOPEDICS (Second Series), edited by Sir *Harry Platt,* LL. D., M. D., M. S., F. R. C. S., F. A. C. S. 330 pages; illustrated. Paul B. Hoeber, Inc., Medical Book Dept. of Harper & Bros., New York, N. Y., 1956. Price $12.50.

In this second series on orthopedics in the "Modern Trend" publications, another all-British panel, headed by Sir Harry Platt, has compiled 11 rather divergent sections dealing with currently controversial subjects.

The reader should take heed of the foreword, which warns that "a work of this kind . . . is the antithesis of a comprehensive textbook." Otherwise, he may be left with the feeling that much is discussed and nothing settled. This is particularly true in the first section which considers reconstructive surgery of the hip joint. Here a succinct review of a multiplicity of anatomic, biomechanical, and clinical problems

are presented, in addition to a brief presentation of many surgical solutions to various problems of both recent and distant origin. The section stimulates thought but settles nothing, nor can it be expected to in such a complex subject.

Two sections were outstanding in this reviewer's mind. "Muscle and Tendon Transposition in Poliomyelitis" dealt comprehensively with its history, morphology, the indications and aims of transposition, and the specific operations available and recommended for each affected region of the body. R. Guy Pulvertaft's section, "Contractures of the Hand," is also of unusual interest. The section dealing rather exhaustively with internal derangement of the knee joint and allied conditions is well worth review by the military surgeon.

All in all, the book has certainly accomplished what the foreword advertised—it presents controversial subjects of current interest in the orthopedic field. The controversy has been allowed to remain, but many interesting thoughts have been presented, suggesting possible methods of approaching a solution to some of the problems. Nonetheless, this book is more to be recommended for hospital medical libraries for the occasional use of their interested staff members, than it is for the personal libraries of the separate staff members.

—DAVID C. KELLSEY, Lt. Col., USAF (MC)

SURGERY OF THE EYE: DISEASES, by *Alston Callahan,* M. S. (Ophth.), M. D. 447 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $25.

A scholarly, masterfully written text, *Surgery of the Eye* presents in vivid, precise style modern concepts of ophthalmic surgery. Many beautiful illustrations amplify the contents and present technics.

Surgical subjects are presented in a very orderly fashion. In the beginning of the book, the various technics and agents employed in anesthesia are presented. Congenital anomalies of the lids, with exhibits and descriptions, are unusually displayed. Anatomic discussions in connection with surgical procedures for blepharoptosis are complete in descriptive detail. Types of entropion, their management and treatment, and results of the various procedures are discussed. The planned treatment of lid tumors with sliding grafts and methods of closing, especially with the Wheeler halving operation, is exhibited in lucid fashion. Operations on the lacrimal system are completely and concisely described with demonstrations of technics. Congenital anomalities and diseases of the eye in children and discussions of their treatment are presented. The photographs of goniotomy procedures are excellent. A section on corneal grafts, cataracts, complications, capsulotomies, and capsulectomies is well presented with excellent descriptions. The section on types of glaucoma, illustrated with angle photographs, is superbly written.

This book is highly recommended because of its easy reading, its complete surgical descriptions, and its excellent style of composition.

—WILLIAM L. SPAULDING, Col., MC, USA

PSYCHOSOMATIC ASPECTS OF SURGERY, edited by *Alfred J. Cantor,* M. D., and *Arthur N. Foxe,* M. D. The Proceedings of the First Annual Meeting of the Academy of Psychosomatic Medicine, Held in New York City, October 1954. 220 pages. Grune & Stratton, Inc., New York, N. Y., 1956. Price $6.50.

This practical sized volume contains the major papers presented to and the proceedings of the First Annual Meeting of the Academy of Psychosomatic Medicine held in New York City in October 1954. While it contains very little that is psychiatrically new, the book should prove worthwhile reading for all members of the medical profession as an excellent review of the subject. The contents are divided into 14 separate sections with 36 different authorities contributing. The papers presented by the surgeons were individually discussed by psychiatrists and psychologists.

Dr. Hans Selye advises that if we are to lay foundations for psychosomatic medicine as a true natural science we must have a precise appraisal of measurable somatic changes caused by the psyche, and the recognition of mental manifestations elicited by identifiable humors of the body. As one reads the psychiatrically oriented comments of many of the surgeons, the psychiatrist may well ask: "Are we as aware of the surgeon's problems as he seems to be of ours?" The preoperative, postoperative, and recovery problems in relation to the patient and his family are for the most part covered in considerable detail, as are the areas that fall to the anesthesiologist. Sociologic and environmental causes and stresses in the construction of an illness are largely ignored.

The problem of iatrogenic disease is not sufficiently stressed, and little, if any, mention is made of the many problems posed by the notorious passive-aggressive character. Dr. William Nachlas comments that serious organic disease can have a strong causative relationship to emotional upsets.

Dr. Harold Rosen wisely emphasizes again that too often psychiatric diagnosis is reached by exclusion, rather than on the basis of positive factors; that even though symptoms are relieved by psychiatric treatment, it cannot therefore be concluded that these symptoms are emotionally rather than organically based. More stress might well have been given to the "reward for ability" concept rather than the "statutory reward for disability," as was brought out by Dr. Irvin Neufeld in his presentation on the recognition and management of post-traumatic psychosomatic manifestations.

In this reviewer's opinion the most valuable material in the volume is emphasized in the next to the last section of the book, titled "What Every Doctor Should Know." The ever-challenging problem of the posttraumatic personality or postconcussional syndrome is excellently reviewed in this section.

This book will serve to better indoctrinate the entire medical profession in the idea that "psychosomatic medicine is medicine" by em-

phasizing the rudiments of both preventive and remedial psychotherapy. Surgeons, internists, and psychiatrists meet on a common ground and begin to understand the thinking and technical skills of one another with the view of better helping mankind in sickness.

—*PHILLIP B. SMITH, Lt. Col., MC, USA*

THE MORPHOLOGY OF HUMAN BLOOD CELLS, by *L. W. Diggs,* M. A., M. D.; *Dorothy Sturm,* Instructor, Memphis Academy of Arts; and *Ann Bell,* B. A. 181 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1956. Price $12.

This atlas consists of 30 one-color plates illustrating both normal and abnormal cells. The majority of the plates have been reproduced from slides stained by Wright's method and the transposition of the colors to the plates has been excellent. Fine detail is shown in the drawings.

In addition to the numerous color plates, there are 109 typewritten pages of useful tables, photomicrographs, and illustrations. The presentation of definitions and explanations is clear, concise, and well indexed. One chapter is devoted to technics and methods, which will help correct many difficulties experienced in the laboratory work.

In general, the atlas is an excellent contribution to hematology and is highly recommended.—*RUSSELL H. WALKER, Capt., MC, USN (Ret.)*

CARDIAC PRESSURES AND PULSES, A Manual of Right and Left Heart Catheterization, by *Aldo A. Luisada,* M. D., and *Chi Kong Liu,* M. D. 116 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1956. Price $6.

Although not apparent from the title, this relatively small text deals almost exclusively with the basic wave forms observed in cardiac catheterization. The book bears the subtitle, "A Manual of Right and Left Heart Catheterization." In this capacity it has serious shortcomings. It contains insufficient material to fortify the beginner and it is not likely to be helpful to one of moderate experience. The first chapter, dealing with the cardiac cycle, is well done and summarizes much that is contained in the senior author's book, "The Heart Beat." However, the chapter dealing with the technic of left and right heart catheterization is exceedingly sketchy and contains little that is new or original. The next four chapters describe normal and abnormal pressure tracings, all of which are timed with respect to the phonocardiograph and without simultaneous electrocardiogram. As a primer it is complete in this regard. The final chapter tabulates the formulas which may be applied to the calculation of total flow, directional shunts, and valve areas.

The book is direct and well written. Illustrations relate almost exclusively to records of pressure. There are no photographs which demonstrate the author's technic or the physical arrangements of equipment. The book's appeal will be limited to a small number of physicians who have an immediate and untutored interest in this diagnostic modality.—*ROBERT B. DICKERSON, Lt. Col., MC, USA*

New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be reviewed in a later issue.

HANDBOOK OF PEDIATRIC MEDICAL EMERGENCIES, by *Adolph G. DeSanctis,* M. D., with the collaboration of *Charles Varga,* M. D., and 10 contributors. 2d edition. 389 pages; 73 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $6.25.

PHARMACOLOGY AND ORAL THERAPEUTICS, A Textbook for Students and Practitioners, by *Edward C. Dobbs,* D. D. S., F. A. C. D. 11th edition. 579 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., 1956. Price $9.

PSYCHOTHERAPY AND CULTURE CONFLICT, by *Georgene Seward,* Ph. D., with case studies by *Judd Marmor,* M. D. 299 pages. The Ronald Press Co., New York, N. Y., 1956. Price $6.

INTERNAL MEDICINE, A Physiologic and Clinical Approach to Disease, by *Robert P. McCombs,* M. D., F. A. C. P. 706 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $10.

Rosenau PREVENTIVE MEDICINE AND PUBLIC HEALTH, by *Kenneth F. Maxcy,* M. D., with 27 contributing authors. 8th edition. 1,465 pages; illustrated. Appleton-Century-Crofts, Inc., New York, N. Y., 1956.

ALCOHOLISM, edited by *George N. Thompson,* M. D., F. A. C. P. 548 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $9.50.

THE LABYRINTH, Physiology and Functional Tests, by *Joseph J. Fischer,* M. D. 206 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1956. Price $6.

LECTURES ON THE SCIENTIFIC BASIS OF MEDICINE, Volume IV, 1954-1955. *British Postgraduate Medical Federation,* University of London. 397 pages; illustrated. John de Graff, Inc., New York, N. Y., 1956. Price $6.50.

THE NATURE OF BRUCELLOSIS, by *Wesley W. Spink,* M. D., D. Sc. 464 pages; illustrated. The University of Minnesota Press, Minneapolis, Minn., 1956.

DISEASES OF THE HEART, by *Charles K. Friedberg,* M. D. 2d edition. 1,161 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1956. Price $18.

DISEASES OF THE BREAST, by *C. D. Haagensen,* M. D. 750 pages; illustrated with 404 figures and 25 charts. W. B. Saunders Co., Philadelphia, Pa., 1956. Price $16.

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES, Volume 66, Art. 1, pages 3-230, August 10, 1956. Editor-in-Chief, *Kenneth T. Morse.* "Epidemic and Endemic Diarrheal Diseases of the Infant." 227 pages; illustrated. The New York Academy of Sciences, New York, N. Y., 1956. Price $3.50.

CLINICAL PATHOLOGY, Application and Interpretation, by Ben*jamin B. Wells,* M. D., Ph. D. 2d edition. 488 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1956. Price $8.50.

THE YEAR BOOK OF MEDICINE (1956-1957 Year Book Series). Part I, Infections, by *Paul B. Beeson,* M. D. Part II, The Chest, by *Carl Muschenheim,* M. D. Part III, The Blood and Blood-Forming Organs, by *William B. Castle,* M. D. Part IV, The Heart and Blood Vessels and the Kidney, by *Tinsley R. Harrison,* M. D. Part V, The Digestive System, by *Franz J. Ingelfinger,* M. D. Part VI, Metabolism, by *Philip K. Bondy,* M. D. 744 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1956. Price $6.75.

DIABETES MELLITUS, Handbook for Physicians, by *Howard F. Root,* M. D., Sc. D., F. A. C. P., and *Priscilla White,* M. D., Sc. D., F. A. C. P. 346 pages. Landsberger Medical Books, Inc., New York, N. Y., 1956. Distributed solely by The Blakiston Division of the McGraw-Hill Book Co., Inc., New York, N. Y. Price $7.

THORAX, Volume II, No. 3, September 1956, edited for *The Thoracic Society* (President, J. L. Livingstone) by *N. R. Barrett* and *J. G. Scadding.* 94 pages; illustrated. Published by British Medical Association, Tavistock Square, London W. C. 1, England. Price $7 yearly subscription (4 numbers); single numbers $2.25.

THE PSYCHOLOGY OF SEX OFFENDERS, by *Albert Ellis,* Ph. D., and *Ralph Brancale,* M. D., with the collaboration of *Ruth R. Doorbar.* American Lecture Series, Publication No. 297, A Monograph in The Bannerstone Division of American Lectures in Public Protection, edited by *LeMoyne Snyder,* M. D. 132 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $3.75.

CONCISE ANATOMY, by *Linden F. Edwards,* Ph. D. 2d edition. 502 pages; illustrated. McGraw-Hill Book Co., Inc., New York, N. Y., 1956. Price $6.50.

INTRODUCTORY PSYCHOSOMATIC DENTISTRY, by *John H. Manhold, Jr.,* D. M. D., M. A. 193 pages. Appleton-Century-Crofts, Inc., New York, N. Y., 1956. Price $6.

CLINICAL ROENTGENOLOGY, Volume IV, The Digestive Tract, the Gall Bladder, Liver and Pancreas, the Excretory Tract and Special Studies Emphasizing Differential Considerations, by *Alfred A. deLorimier,* M. D.; *Henry G. Moebring,* M. D.; and *John R. Hannan,* M. D. 764 pages; 1,112 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $24.50.

NEUROLOGICAL NURSING, A Practical Guide, by *John Marshall,* M. D., M. R. C. P., M. R. C. P. Ed., D. P. M. 166 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $3.75.

THE SUPPORT OF MEDICAL RESEARCH, A Symposium organized by The Council for International Organizations of Medical Sciences, established under the joint auspices of UNESCO and WHO, edited by Sir *Harold Hinsworth* and *J. F. Delafresnaye.* 170 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $4.

CHEMOSURGERY IN CANCER, GANGRENE AND INFECTIONS, Featuring a New Method for the Microscopically Controlled Excision of Cancer, by *Frederic E. Mohs,* B. Sc., M. D. 305 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $13.50.

PROGRESS IN RADIOBIOLOGY, Proceedings of the Fourth International Conference on Radiobiology held in Cambridge on 14 to 17 August 1955, edited by *Joseph S. Mitchell, Barbara E. Holmes,* and *Cyril L. Smith.* 557 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $12.75.

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